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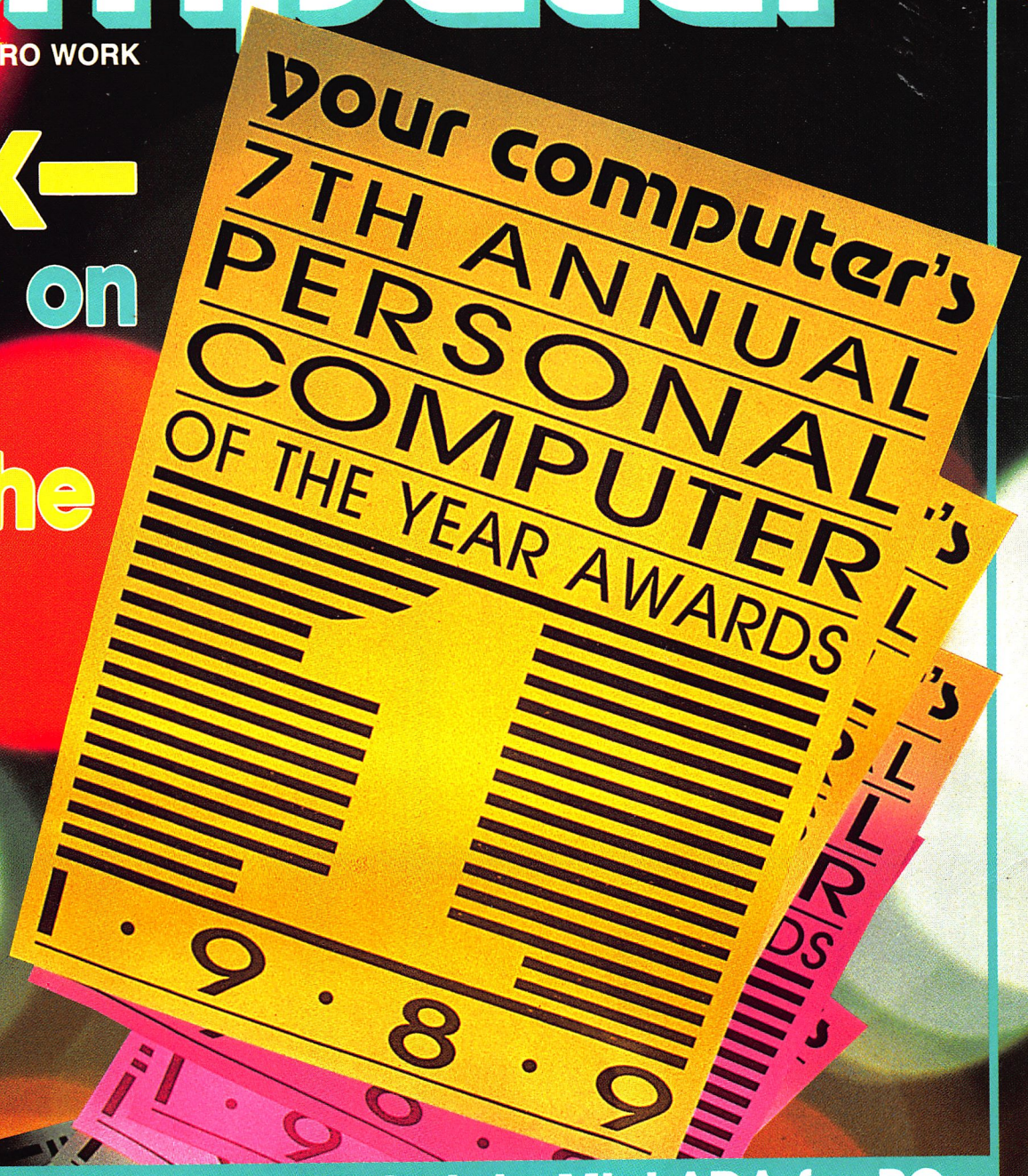
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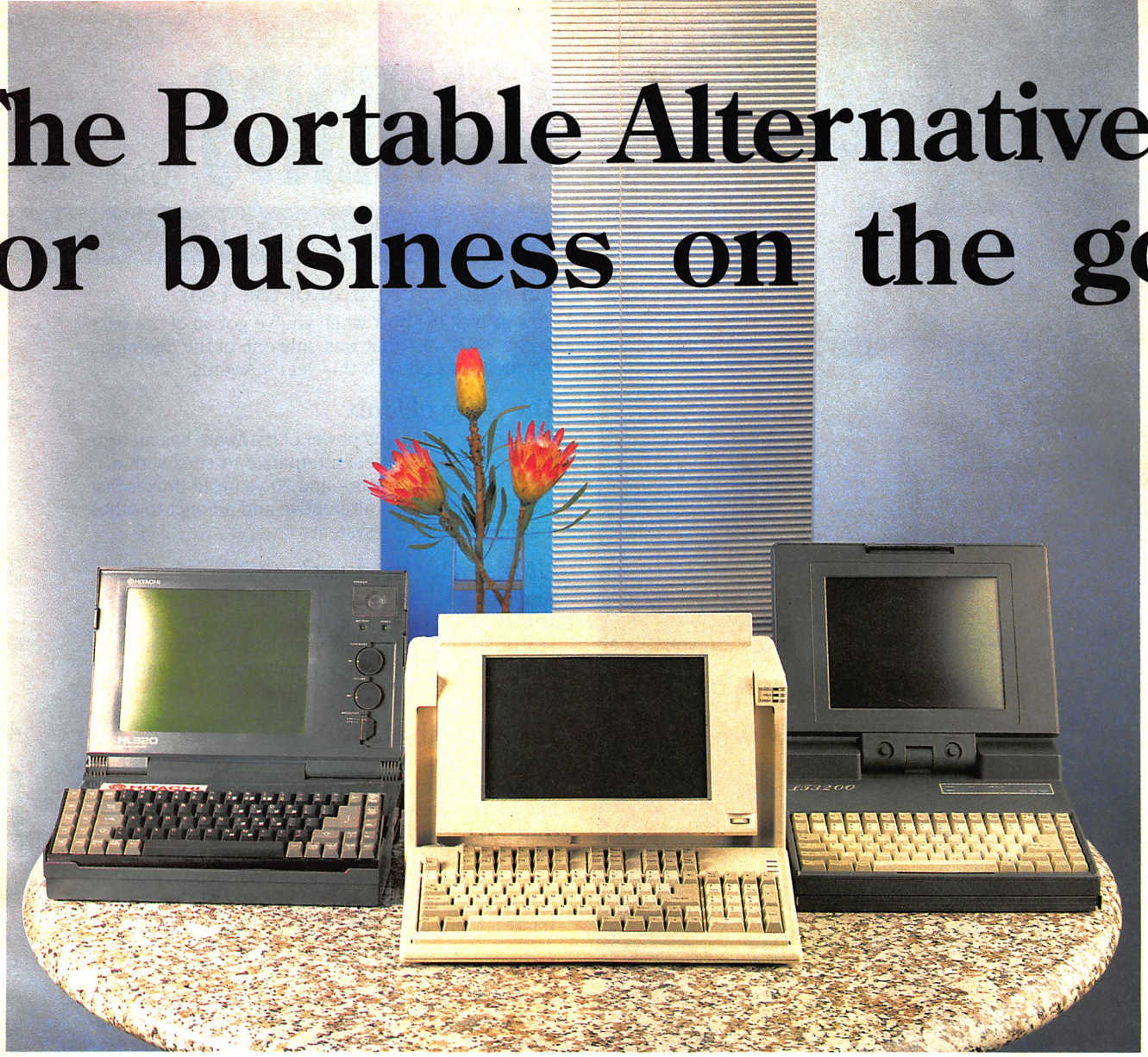
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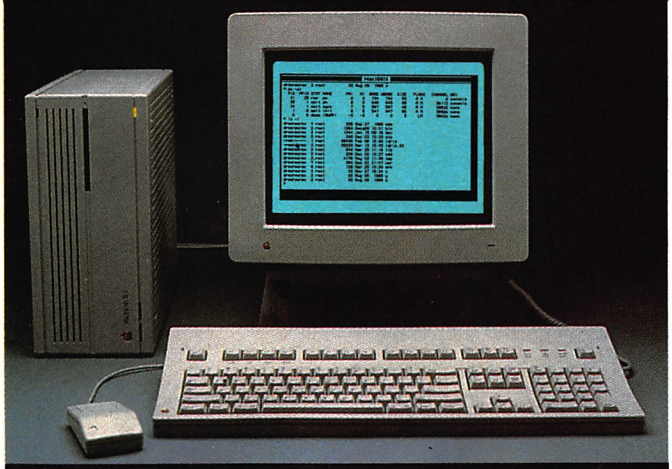
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THE GREP OF UNIX 26



UNIX AND THE MAC 44



DATABASE DATA 90

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How to pick the best when you've got 30 of the best to choose from – that was only one of the dilemmas our judges faced with this year's Awards.

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The rapidly increasing power of hardware has made a PC-based system a real alternative to sites with a number of online users – and 20-year-old Unix is fast coming of age as an alternative and adjunct to other multiuser operating systems.

Unix – why the fuss? 36

You'd be forgiven for feeling a bit left out of the recent stirring over Unix if you've been bought up on PCs or Macintoshes. Unix seems to be some strange computer-Esperanto spoken only in ivory tower institutions.

Unix and the Mac 44

The first question anyone should ask about the new phenomenon of Unix on the Mac, is why? More than any other computer, the Macintosh is synonymous with its operating system – the aim of which is to be largely invisible. And, since it is probably the best operating system in the world for a personal computer, why would anyone want to change it? As Stewart Fist relates, there are a number of reasons...

PCs in control! 50

There's much more to computer applications than data crunching and word processing – a Melbourne-based company is putting PCs in control of the factory floor, fire protection systems, office automation systems and even model railroad sets!

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This month, Sharon France reports on a successful classroom experiment based on Explore-A-Story and brings us on update on Carmen Sandiego's whereabouts.

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NEXT MONTH INCLUDES

One of the most rapidly developing areas in the computer industry is that of scanner technology, particularly optical character recognition – our indepth report will bring you up-to-date on the state of the craft. If you're going to apply scanning in your work, a fast and powerful computer is almost a necessity, so we will also be featuring 80386- and 68030-based machines (with some interesting asides on what Intel's new 80486 and i860 have to offer). We also have a report on natural language processing, one of the most significant aspects of AI research, and a new series on electronic communications covering X400 and X500, EDI, ISDN and all the 'mechanicals.'

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Quattro – counting out 1-2-3? 58
Lotus is loosing its command of the spreadsheet market – and this full-featured, low-priced offering from Borland is one of the reasons.

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INSTRUCTION SET

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What *BIRO* did for the Ballpoint . . .
LANtastic is doing for Local Area Networking!

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The Experts are talking about LANtastic . . . and the Network Eye

PC MAGAZINE EDITOR'S CHOICE

"Our clear choice for a favourite low cost (but highly effective) LAN is LANtastic from Artisoft. The code is fast, the implementation of NetBIOS is excellent, the services are great, and it uses only a tiny amount of RAM. As a final testimonial, the LANtastic software, installed over NetBIOS on Western Digital Ethernet cards has been installed in several machines in the PC LAN labs."

Editor's Choice, PC magazine, March 1989.

1988 BYTE AWARD OF DISTINCTION

"a lot of LAN bang for the buck. It also lets you access a CD-ROM drive over the network without DOS extensions in the remote machine. Columnist Jerry Pournelle uses LANtastic ... every day at Chaos Manor."

BYTE Award of Distinction, BYTE Magazine, January 1989.

". . . LAN of the Year."

Jerry Pournelle, BYTE Magazine, March 1989.

PRODUCT OF THE YEAR LAN MAGAZINE 1988

"The Network Eye's uses seem endless. If you have a big job to process, send part to an idle PC and watch it through The Network Eye. Or take information from a spreadsheet on someone else's PC and put it in the report you're writing on your PC. The Network Manager could use it to troubleshoot remote PCs or help confused users. Broadcast information to remote computers for demonstrations, such as in schools."

LAN Magazine, January 1989.

"The Network Eye is a neat piece of software with nearly endless uses ..."

LAN Control Product of the Year, LAN Magazine, February 1989.

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JAKE KENNEDY



A simple vent for frustration

WE SPEND a lot of time chasing distributors for products, here at the magazine. This time of the year, with our Awards on, that can become almost a full-time job – partially because there are so many items to chase (there were over 30 pieces of hardware and software we looked at before deciding the Finalists), but mainly, it seems, because distributors, one, don't have the stock their advertisements tempt us to buy, and two, they are not particularly interested in service.

You can rightfully expect hot products to be in short supply – when Toshiba tells me that we can't have a T5200 until next week and then only for several days, I can understand that: it's not only every computer writer and computrendy in Australia who wants one – the machine's much sought after in the 'corporate computing environment,' too. And the size of our market here means that most multi-nationals don't place us very high in the stock allocation stakes. So I understand why products like that are hard to put your hands on, especially on short notice.

But, I've recently been chasing products (not necessarily for the Awards) from three of the largest software companies in the world. I won't recite all of the boring details (I'm sure everyone has a similar tale to tell), suffice to say it's extremely frustrating. But of course it wouldn't be politic to take it out on the industry – we're all gentlepeople. I've developed some little games I play to relieve that frustration.

Now, something I do with most new software is to view the .EXE or .COM file with the Norton Editor – of course it all looks like garbage except for the text messages, prompts and the error messages (I start from the bottom of the file because most of the time that's where these bits are found, except for the name, version number and clues to the language that was used, which are usually at the top). It's amazing how much you can learn about the approach the author/s have taken that way; most of the time that's all I need to do, aside from a bit of play, to learn how to drive the program (this method isn't infallible and over-confident application of it can give embarrassing results, but it's a good way to avoid manuals as long as possible).

By far the most interesting bits are error messages. Now that's an area that could be standardised: the Error Research and Regularisation Organisation (Really) should be formed by a consortium of the biggest names in the business – actually, there should be several consortia, after all what's the use only one standard? – to compete and argue. That gives everyone maximum opportunity to push their barrow; and there should be at least one dragged-out court case to keep the press interested. But I digress.

Back to the messages: probably some of the driest writing in the world is found in them, but they can give some immediate impressions of what the software is like and the publishers attitude to users. For example, it's obvious that some programs are going to treat you like a backward, recalcitrant child who really shouldn't be trusted with a loaded keyboard. On the other hand, when I see the likes of 'error 2001: Null pointer argument' and 'error 2003: Integer divide by 0', I know it's time to keep the manual handy, or even to read a chapter or two.

Some times to relieve that frustration I mentioned above, I daydream I'm a professional error message writer (only occasionally) – it's one of the best vents I've found. Just think of it: there are potentially millions in a captive, trepidatious audience out there, one that's unquestioning, unsure of itself and is looking for direction. And in their moment of need only *you* can help them – it's almost an awe-inspiring concept.

These are some I've been working on (and collecting), some of them need polishing yet, or may be too helpful, but I'm working on that –

To terminate this program and regain control of the operating system, press the ∞ key.

Software failure. Refer to the *Tecnhical Usesr Manual*, May 1962 edition (English translations are available).

Fatal error. Please check the date of your warranty.

Error 214. [This is an actual example – of course there is no such error listed in the manual.]

Call failure. Unfortunately that sector is corrupted at this time. Do not hang, your call is in a queue and will be input by the first available operation.

Pre-programmed timeout. Your licence to use this software has expired. To continue to enjoy the benefits, ease of use and friendliness of our software, send your Amex number to the address printed on the shrink-wrapping of the original package.

You get the idea. Suggestion and errors from readers are welcomed.



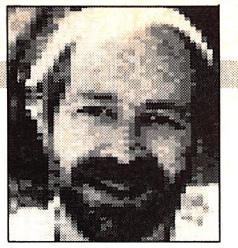
June 1982

From Matt Whelan's Editorial on the occasion of YC's first birthday – Without patting ourselves on the back too much, I think it's fair to say *Your Computer* has set standards in its first year of publication. It has set standards in editorial format, by sourcing virtually all material locally quality material written by Australians about the Australian user, seller, newcomer and the equipment available in this country. It has set standards in the level of communications with readers. We're taking part in the personal computer experience with you, not just reporting it.

dBase graphics

IN OUR April issue Matt Whelan mentioned dGE, a powerful graphing/graphics package that works with nearly all implementations of the dBase language, FoxBase, Clipper, Quicksilver, dBFast, Emerald Bay/Eagel and even Microsoft C. Since then we've had a fairly constant stream of calls from readers who have had trouble contacting the two distributors listed: RCM Software on (03) 299 2041 and Database Advisors, (062) 85 2097. Those numbers are right, keep trying. They are both relatively small operations who found themselves inundated with work after Matt's mention. □

MATT WHELAN



Would I buy it?

A year ago I did everything on the PC and 'played' with the Mac, but I keep transferring more and more things to the now grown-up Apple.

WOULD I really buy the Personal Computer of the Year and the Software Product of the Year? After all, voting as a judge is often different to voting with your own dollars, especially when the criteria applied to both decisions can be vastly disparate.

After the arguments, discussions and agonisings of the awards had died down, I sat back to take a 'personal' look at the award contenders list. And, while I was surprised to discover I could find a use for just about everything on the list, I managed to narrow it down significantly based on my own needs.

What follows is a run-down on the products which would actually get my dollars (or which already have) if I went on a shopping spree tomorrow. It's in a sort of 'order of preference', software first because it's easier to spend hundreds of dollars at a time than thousands, and PC first purely because I currently do most of my income-producing work on this platform.

It's interesting how this is changing. A year ago I did everything on the PC and 'played' with the Mac, but I keep transferring more and more things to the now grown-up Apple. My desktop publishing activities are certainly far more comfortable there (when I count-up seminar manuals, brochures and newsletters, I realise I have already knocked out more than 3000 pages of 'finished art' on the Mac this year), as is anything related to drawing and art.

Recently I automated my regular communications sessions on Compuserve by switching them to the Mac and, according to Nantucket, it won't be long before I can do all my Clipper development on the Apple even if the target environment is the PC. Times are certainly changing for me.

My Contenders

THE FIRST piece of software I would buy (if I hadn't already) would be the Norton Utilities version 4.5, Advanced. I guess this makes it *my* Software Product of the Year. These days I take Norton's Quick-Unerase and Unremove-Directory for granted, but the things that Disk-Test, Format-Recover and Norton Disk Doctor do for me still knock me out.

When I first set-up my Fidonet bulletin board, I didn't understand why Bill Bolton (who did most of the work) had Format-Recover in the Autoexec.Bat file. 'Bill, I'm not the sort of dummy who accidentally erases his hard disk!' I protested, but he insisted I leave it there. Some months later, I walked into the study to find the BBS down, and discovered a destroyed File Allocation Table.

I didn't trust Mr Norton completely at that stage, so I sat there all afternoon picking-up little pieces off the drive, backing-up everything that was recoverable to floppy. When I was finished, I had recovered about 60 percent of the files. The rest were history. Then I ran Format-Recover, and in minutes it was all fixed – every damn thing was where it should be! I didn't believe it. I still don't, even though it has done the same for me three times since then. Life wasn't meant to be *that* easy.

Second product to get my dollars would be Clipper Summer 87, except I already have two. The dBase language is my major business, and Clipper is the Number One dLanguage development tool. I couldn't live without it even if I didn't make money from it, as I do all my personal utilities, my bulletin-board management, and even some of my system-level programming in Clipper. I offer a challenge early in my Clipper seminar: 'You can do *anything* in Clipper,' I tell them (quickly adding the qualifier, anything 'you would sanely want to'), 'coming up with the problem is the only real challenge.'

Next on my shopping list would be Desqview 386: while we threw it in together with CDOS and PC-MOS in the awards, Desqview suits my personal purposes – pure multitasking, no multiuser, with virtually total DOS compatibility – by far the best.

As a productivity improver, there's nothing like DV. I even run PageMaker as a task (and that means MS-Windows, too) when I'm desktop publishing on the PC. But you really do want a '386 to get the real benefits of such a program (but, of course, we *all* use 386 machines these days, don't we?).

While I was visiting my favourite Info-Magic dealer, I'd grab Adobe Streamline – there has never been an easier way of turning bit-mapped graphics into far-more-useful PostScript outlines. I wouldn't use it all that often, but when I did it would be worth it.

Gosh, what a shop of wonders that Info-Magic dealer is: I'd also have to sit there for days making up my mind over whether to buy Adobe Illustrator or Aldus Freehand as my drawing program. Freehand now seems to have the power edge, but for the level of use I'd give it, either would do nicely. I'd have just as hard a time choosing between Aldus Persuasion and More 2.0 to use in preparing overhead slide presentations for my seminars. Both are way too good for my simple needs, but their ability to turn my schedule outlines into a high-quality presentation almost instantly is hard to believe.

And Some toys

WELL, I don't really need them any more, but if there was any cash left I'd have to end my software smorgasbord with a taste of Digital Darkroom and the 'real' Software Product of the Year, Wingz. I don't need an intelligent (and masterful) image processor like Digital Darkroom, but I'd want to have one to play with just so I could marvel at the technology advances we're making. And as for Wingz, well, if ever I'm going to find a spreadsheet interesting for long enough to put it to good use, this looks like the one.

And now the hardware. Ugh. I'm still twisting my mind around the three portables. I think I'll phone Compaq and ask when we might see a '386 in that little package; if that doesn't work out, I'll grab a 40-megabyte T1600 for my seminar tours. Finally, I'll squander the remainder of the second-mortgage I'll need to take out on a Macintosh IIcx with a *b-i-g* screen. My Mac II has to go soon, and I know I could no longer live without one of these wonders. □

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FlyByWire - the ultimate PC remote control software. Combined with the Gateway V3 it allows complete remote control via modem over another computer's screen, keyboard, disk and printer. And with FlyByWire's file transfer it's as good as being there.

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HOWARD KARTEN



Printer problems!

NEXT MONTH'S main feature is '386 machines, and since any decently designed '386-based machine would do billions of computations over its life and would be well worth having, it's hard to find something to say about them that's interesting, useful and informative. Nevertheless, I've spent my usual seven or eight hours in deep meditation on the month's topic, and generated my usual serious, philosophical essay that addresses the main topic. At least tangentially, anyway.

I've always believed very strongly in the KISS (Keep It Simple, Stupid) rule, and since my 8086-based machine still works properly, I've had little need (or perhaps more accurately, excuse) to replace it. Still, the '386-based machines are looking very attractive – and the '386 clones are coming way down in price as well. In the US, I've seen '386-based systems advertised for less than US$2000; given the speed and capabilities of such machines, it's hard to see why any new buyer would settle for anything less.

The 80486, Intel's successor chip to the 80386 announced in mid-April, offers complete compatibility, upward as well as downward, with the '386. (The 80386 chip seemed incredible enough when it was announced, and the '486's specs seem even more incredible: it can directly address 4 gigabytes of data – that's gigabytes, as in billions – and has a virtual memory capacity measured in *terabytes*.) This compatibility will help '386 machines keep their value for a long time. Another aspect of the '486 that will help '386 machines retain their value, or at least prevent a precipitous drop in price, is that the '486 chip is expected to sell for around US$950, and the machines based on it, for upwards of US$10,000. (By the way, I've seen figures that place development costs for the '486 at around US$250,000,000 – I'll bet that's some kind of record in terms of cost per gram or per square inch.)

All this, of course, got me thinking, and this month my thoughts were about obsolescence and maintenance. Actually, part of the reason I have been thinking about these issues is that this has been a stressful month hardware-wise.

For starters, we had some printer problems. Anyone older than about ten knows about that quintessential humour/horror scene; the smoking electrical device. It's a cliche: an electrical device blows up, catches fire, emits smoke, or self-destructs in some other dramatic manner. The cause is often some form of poetic justice (or at least, is perceived that way). Although this scenario is usually good for a laugh, I bet few of us have actually seen it first-hand, or know someone with first-hand experience of it. Ever since I formally studied matters electrical, I've discounted this scene as more fanciful than real.

Until recently, when it happened to Ms Computer Writer. Actually, I was a little disappointed: I trust her observational skills more than those of most people, and she reported that it actually happened – and I missed seeing it firsthand!

I've seen figures that place development costs for the '486 at around US$250,000,000.

First the printer. . .

I'D BEEN out of the office, and Ms Computer writer had been playing with a new, rented printer for her Mac when, she reported, it started to smoke! Thinking that this was some form of hyperbole, I asked innocently, 'What happened?' 'It started to smoke,' she insisted. I took a deeper whiff, and it was then that I smelled the familiar aroma of essence of overheated electrical winding.

My always strong scientific curiosity asserted itself, and I overwhelmed her with questions: what operation had she been doing when it started, where was the smoke coming from, had anything been jammed, did she have any hint ahead of time, and so on. Unfortunately, although Ms Computer Writer originally set out to be a scientist, she was unable to provide much in the way of detailed information; I have a slight hunch, too, that she may have been more interested at that moment in support, reassurance, or at the very least, figuring out how she was going to replace the printer, than in scientific enquiry.

All in all, she looked flabbergasted. It didn't help matters any that when she asked me, 'I also had the computer attached to the same socket. Is it possible that too much electricity was coming out of the mains?', I burst into laughter, since it struck me as such a silly, such a naive question. (It's always easier to laugh, too, when you know the repair costs will be coming out of someone else's pocket.)

Shortly after that, she booted-up on the PC in my office, which is where the formed character printer is. When she turned it on, surprise, surprise: nothing happened. She began to think that perhaps she had the reverse Midas touch. I suspected that my printer might have failed because of something obvious, so we set out to have an 'educational experience'. I played doctor (surgeon, actually) by removing the cover and looking around inside, I'd been itching to do this ever since I discovered there was no obvious way to do so. With Ms Writer's help, I discovered some cleverly hidden snaps, and we removed the cover.

The main thing we saw was a couple of PC boards. When I saw the modular connectors on them, of course, they exerted a magnetic pull on me, and I could not resist unhooking them and removing the whole board for examination. It was only later, when we were re-assembling the thing, that I noticed two identical plugs on the board, and realised that one of the plugs could connect to either, and that I didn't know which was the proper one. (What had I been looking for in the first place? Good question. Something obvious, I guess. No doubt, in the deepest, preconscious recesses of my mind, I was expecting a little note somewhere on the board, saying 'Here's the problem!')

The ending of this episode turned out to be simple: after six years of faithful duty, with never so much as a glitch, the trusty formed character printer had given

up the ghost, and had to be taken in for repairs – this time, at my expense, and naturally, just at the time when I had some important material to print.

. . .then the modem!

IN AN EFFORT to find a way of getting my material printed, I made a few calls and was surprised to learn that my town, which is just a small suburb of Boston, had a computer service bureau. It sold computers and rented time on '386 machines and printers, and might be able to print my material. In the meantime, I attempted to crank up a new 2400-baud modem I'd recently purchased from a casual acquaintance. I found that my old cable had a male connector, and the modem called for a female, so I fitted a female to the connector, connected things, changed the number to the 2400-baud port, and cranked the modem up. Although it dialed out OK and made the connection properly (I could hear the remote modem's carrier, and the 'carrier detect' light on the modem went on), I didn't get any data on my screen. After lengthy phone consultations, the manufacturer's technicians suggested I ship it back.

Naturally, like any normal computer user, I couldn't resist trying it 'just one more time.' I removed the connector, reattached it, and again dialed up my e-mail carrier. This time, I was clearly getting something, but it was all garbled. Naturally, this made me wonder what was going on and why all my hardware was rebelling and whether all my old training had suddenly been wiped clean one night, like RAM memory, when I went to sleep. Eventually, and by the purest chance, I decided to see if I could contact another service. When that worked, I checked back with my electronic mail service – only to find it had been experiencing problems with its 2400 baud port!

Back to the service bureau: of course, my own obsolete word processor wouldn't work on its fancy new machines, but I quickly saw an alternative solution: I would write my files to disk instead of the printer, and then just do a basic print operation on them at the service bureau. In principle, it was a simple, yet elegant solution.

In principle. After an hour's search, I found the software I needed to redirect output from the printer to a disk, and it only took another hour to write all my files to disk. Naturally, when I went to the service bureau for the second time, the printer control codes I'd used turned out to be incompatible with the laser printer, so I'd wasted all that time.

Remember, this was at the end of a long, annoying week; so when I thought I detected a few snickers among the service bureau personnel about my outmoded hardware and software, and about how nice their brand new '386 machines were, I did my best to slink out the door as fast as I could.

Ms Computer Writer periodically gets on my case about my hardware and software being obsolete, and maybe it is. I know, too, that she'd love to get her hands on a '386 machine. Hmm... perhaps if I upgraded to a '386 machine, I'd have enough memory to run a few partitions on it, and a LAN as well, and which would help me use the new laser printer Ms Computer Writer plans to get, so we could hook up several printers and... □

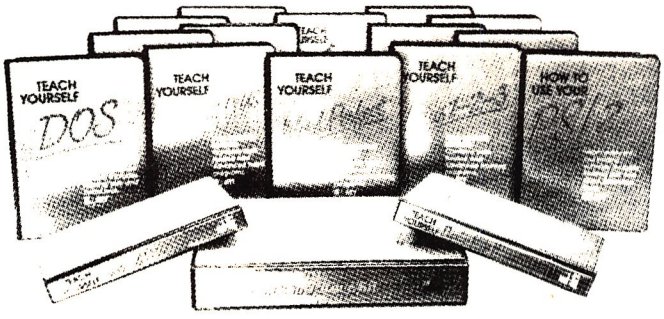
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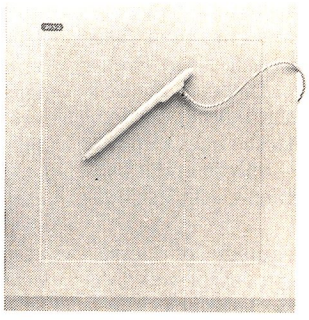
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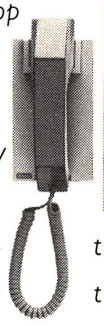
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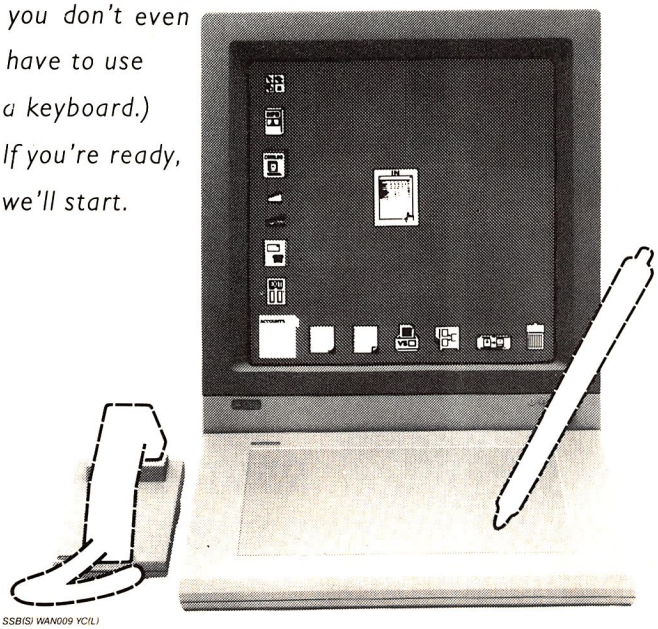
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By which time you will have written on a copy of a spreadsheet stored in the computer, recorded a voice message concerning your notes, and sent both as a package to a colleague in another part of your organisation. Using only a pen and a phone. (No, you don't even have to use a keyboard.) If you're ready, we'll start.



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Simply pick up the pen and touch the notepad.

That's right.

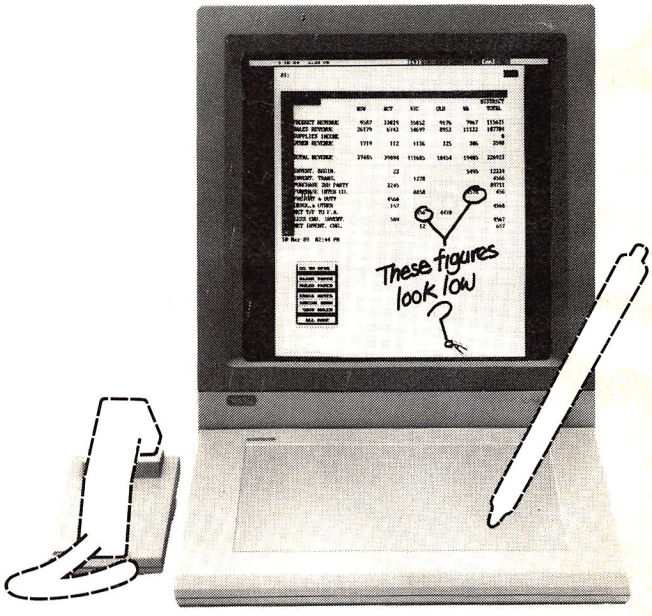
See the icons? Those little pictures on the screen. They represent the things you'd normally have on, or next to your desk.

The icon of the in-tray, for example, shows a document waiting for your attention.

Place the pen on the notepad. You'll notice a little picture representing a hand appearing on screen.

Moving the pen on the notepad moves the hand on the screen.

Move it over the in-tray, tap the pen and ... hey presto, an image of the document (a spreadsheet, as it turns out) fills the screen.



You'll notice that a couple of the figures on it don't look right.

You'd like to explain personally to your colleague, so that there's no misunderstanding.

But he's in Perth and you're in Sydney.

Nothing could be simpler.

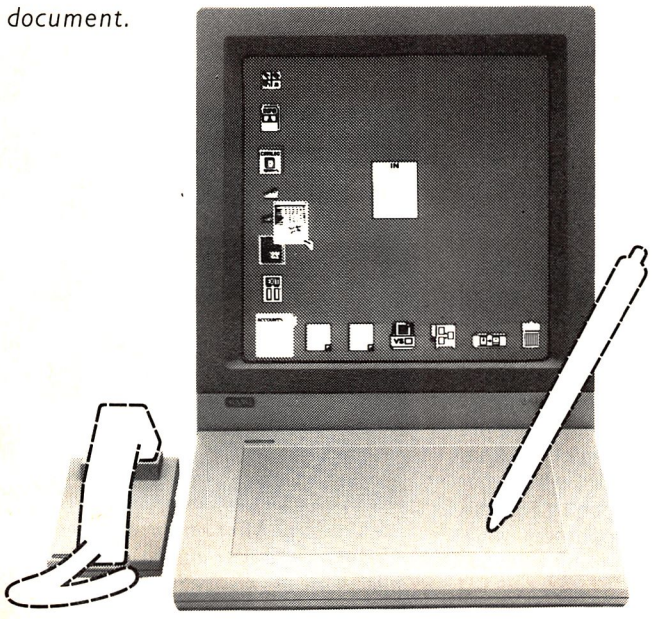
Pick up the pen and write on the notepad. (A picture representing the point of a pen will now appear on screen.)

Whatever you write or draw there will be written on the spreadsheet.

Now, pick up the phone and record whatever message you wish to accompany your note.

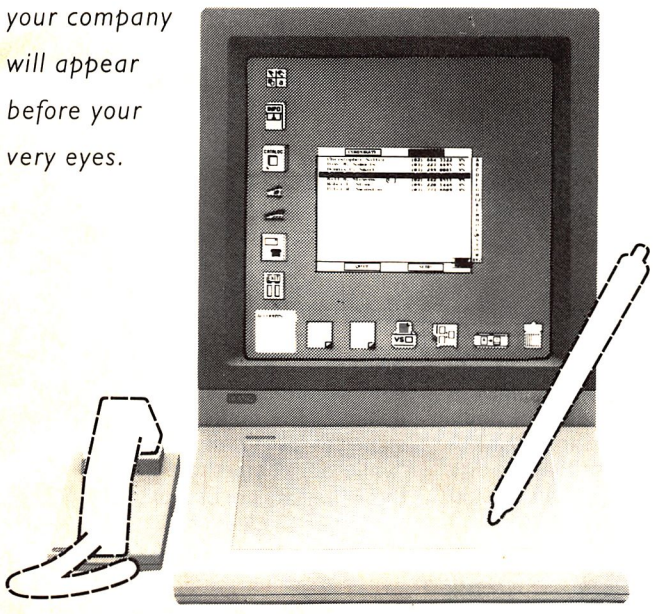
If you think what's happened so far is remarkable, the next part will truly astonish you.

Tap 'Go to desk' on the menu and you'll find yourself back with the icons and a reduced copy of your document.



Using the point of the pen, pull the document over to the icon that looks like a telephone directory.

Place it on the icon and an index of the people in your company will appear before your very eyes.



Tap the name of your colleague in Perth and then the word 'send' at the bottom of the index.

At the other end of the country he has just received the image of the spreadsheet in his in-tray together with your written and spoken comments.

(Just as if you had walked into his office.)

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In the same way you can print hard copies, scan documents and images, write on blank pieces of paper and staple one thing to another.

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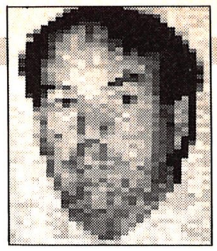
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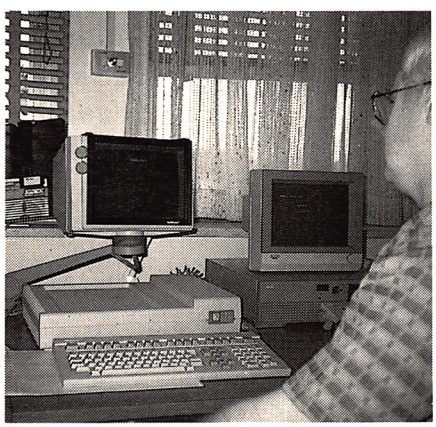


On-line Tax

THE TAX OFFICE is considering reducing paperwork with computer-generated tax returns. The Commissioner for Taxation, Trevor Boucher, speaking at a seminar in Canberra recently said he was in favour of electronically lodged returns. This was one way the tax office could modernise its image, Boucher said.

The tax office is hoping to allow tax payers or their accountants to file assessments from a PC via modem or floppy disk. Individual returns would then go directly into the tax computer database. Before this can happen the tax office needs paperless assessment system. Introducing revised tax file numbers is the first stage of paperless assessment.

Boucher said many taxpayers would need less than a one page tax return after computer links were set-up for PC. According to Boucher the tax office is planning further streamlining for tax assessments. This had already begun with self-assessment and upgraded tax file numbers. Most of the changes made so far were linked to upgrades in the tax computer system. Boucher said that at present the tax office does not have the capability for electronic returns but it will be part of future computer acquisitions.



To speed-up orders to the more than 150,000 customers on its mailing list, the Canberra Mint has changed its back-up system from cartridge to industry standard tapes – the tapes are then sent to an outside mail-order house for order processing. Most of the orders are for special proof coin sets or for uncirculated gold and silver coins. '

Along with improvements in tax computers was a need for more professional staff, Boucher said. One of the big tenders out at present is for a new tax computer system. Companies such as Fujitsu and IBM have tendered for the tax system. Successful tenderers are expected to be announced before the end of the financial year with rumours suggesting IBM will get the nod.

Computer spree!

GOVERNMENT spending on computer equipment nearly doubled in the first half of this financial year compared with the same period in 1987. The latest figures show Commonwealth government departments spent $121 million on computers and peripherals from July to December 1988; the corresponding figure for 1987 was $63 million.

Big spenders included the Department of Administrative Services which was up from $12.1 million to $36.4 million, while Tax Office spending shot up to $5.9 million compared with less than half a million dollars for the same period in 1987. Other departments with big computer bills included the Department of Community Services and Health, where purchases rose from $1.2 million to $8.7 million and the Defence Department which more than doubled expenditure from $9.4 million to $20.3 million.

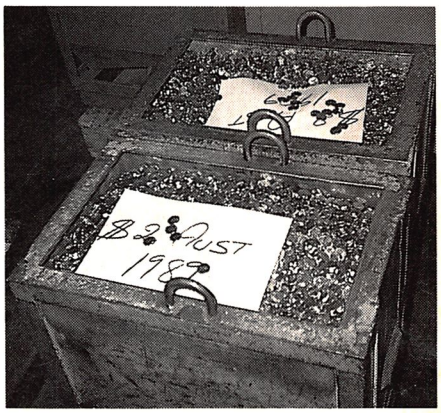
The Department of Foreign Affairs and Trade had a huge percentage rise from less than $100,000 in 1987 to $2.09 million in 1988.

The figures for departmental computer purchases are supplied through the government's Tendernews Service. This is an on-line service updated fortnightly. A spokesman for Tendernews said many government departments were now following finance regulations and declaring purchases more regularly. This means the dramatic expenditure increases for some departments may have more to do with getting their paperwork together rather than surges in expenditure.

Mint computers

COINS ARE big business today with our own Mint in Canberra, producing some three million coins a day, now competing for overseas contracts. Jim Aked, officer in charge of data processing for the Mint says the project software was trailed in 86-87 'It soon became apparent that the disk storage capacity was too tight and would need expanding,' Aked said.

The software used initially was version 4 of FACT, a business information system designed for a manufacturing environment. 'We are, after all, a factory producing coins for customers here and overseas,' Aked pointed out. Initially the system used two VS65s, one for data processing, the other for maintaining the Mint's mailing list as well as word processing. Now the upgrade is finished, FACT version 5 uses a Wang VS7120 with 8 megabytes of memory plus 500 megabytes of disk capacity. The Mint has also taken delivery of two extra 450-megabyte drives providing a total of 1.4 gigabytes of storage.



The Canberra Mint can produce some three million coins a year and has now become much more aggressive in its marketing, tendering for coins supplies to small countries without a Mint.

To speed-up orders to the more than 150,000 customers on its mailing list, back-up for the system has changed from cartridge to industry standard tapes. Aked says this allows an outside mail-order house to process their orders from tapes on to a laser printer. Most of the orders are for special proof coin sets or for uncirculated gold and silver coins. 'Since swapping over to tapes our ordering is much smoother and we have been able to eliminate the peaks and troughs which caused some staffing problems,' Aked said.

The Mint has become much more aggressive in its marketing, tendering for coins supplies to small countries without a Mint. 'The coins we produce are designed to last 40 years,' according to Aked, 'while our competitors in Singapore and the Filipinos cannot match the quality of Australian-made coins.'

CANBERRA COMMENT

If all else fails, read the instructions!

AUSTRALIAN Defence Department officials are in a tail spin over missing software instructions for computer-guided weapons purchased from the US. The computer design manuals are vital for modifying and maintaining weapons bought for the FA18 fighter. Other instructional problems include computer modifications for the F-111 plus radar enhancements for the FA/18.

The number of disputes over US weapons computer secrets has increased because Kim Beazley the Australian defence minister insists that all weapons systems bought from overseas must come with a complete set of manuals. The problem at present is peculiarly American, despite the fact that Australia has spent over a billion dollars on US weapons recently.

The head of the Australian Defence Staff in Washington, Air Vice-Marshall Barry Gration, is reported as saying he spends most of his time sorting out technology transfer disputes. One particular problem is with the FA/18 fighter which, if supplied to other countries in the future, could conceivably fight against Australian FA/18s. However the computer software in the Australian models cannot recognise another FA/18 as a hostile aircraft. And, without the computer manuals, the aircraft could not be modified to cover this possibility.

Bosch botches boxes

IF YOU HAVE ever been unfortunate enough to have the computer black box in a car fuel injection system die, then this story is for you. Bosch makes most of the black boxes. However, prising the information about the contents of a Bosch black box from them is tricky. Electronics repair people say Bosch won't tell.

Recently a Canberra European car dealer had seven black boxes collapse in near-new vehicles. The dealer's replacement cost was $1100 each and Bosch said they cannot be repaired (the company apparently throws the faulty boxes away).

However, this story has a nice twist because one of the faulty boxes was opened and checked by a Canberra video and computer repairman. His verdict was a dry solder joint on the output transistor – cost, one dollar. All seven boxes had the same problem. The Bosch replacement price of $1100 a box seems a trifle excessive particularly when compared with current PC prices. □

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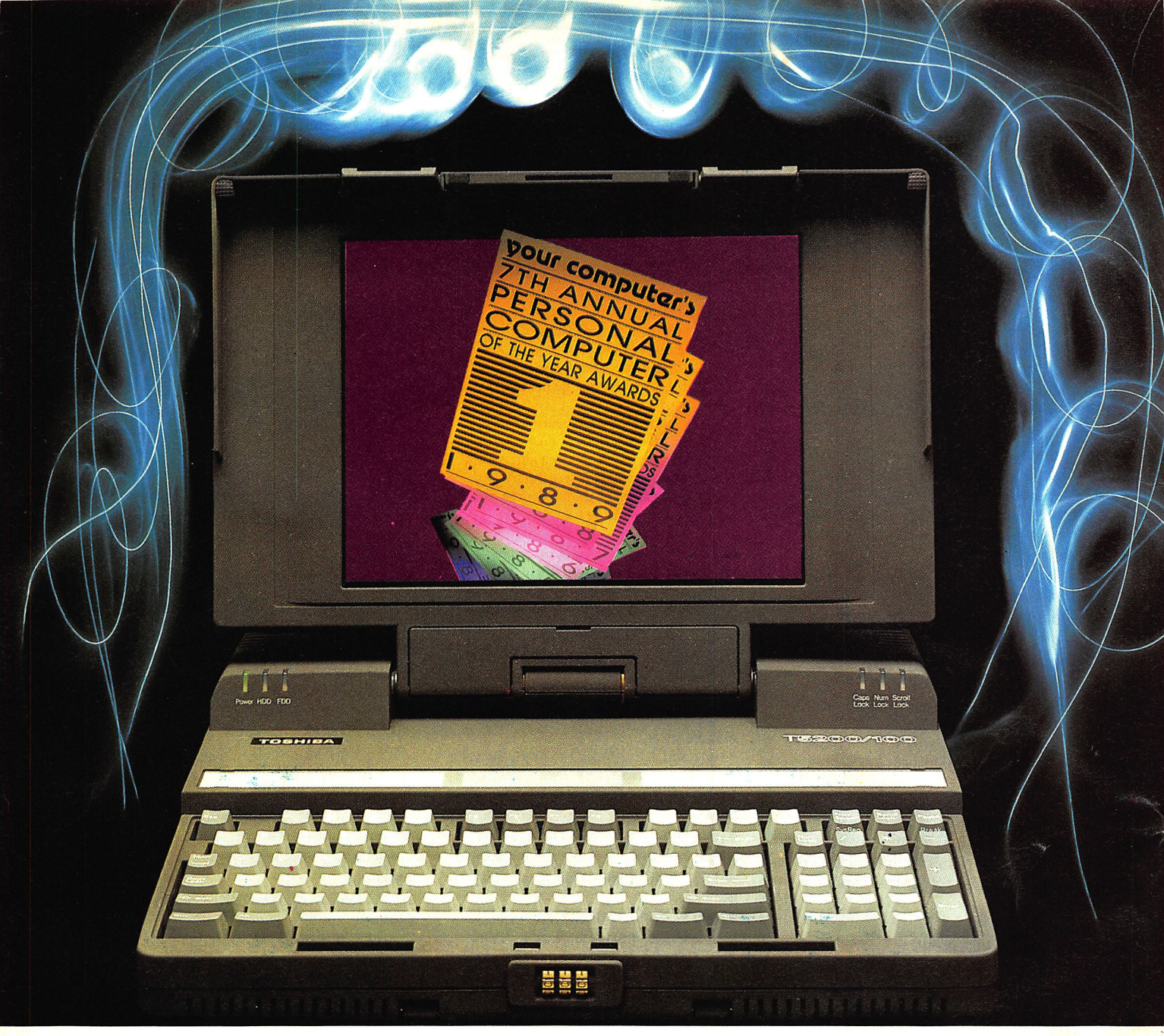
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Personal Computer of the Year

OKAY, WE'RE going to come out with it straight away, no beating around the bush: Toshiba's atom-sized bombshell, the 5200, is Personal Computer of the Year; and, just to rack up another 'first' for the award, a Macintosh mainstream business program – the Wingz spreadsheet package – is Software Product of the Year.

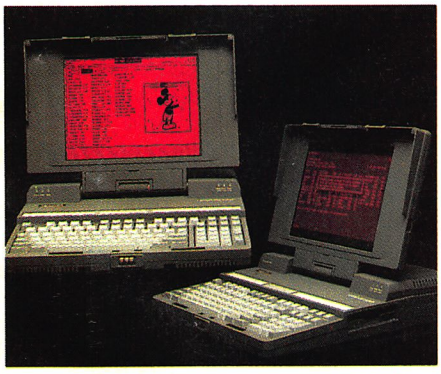
Wow! Doesn't saying it fast like that make it sound easy? It's just like they walked into our offices and declared themselves winners... Sigh, is picking a Personal Computer of the Year winner never going to get any easier? Every year we wipe our collective brow after the judging, mutter about it being harder than ever, and assure each other it will have to be easier next time; it never is.

How to pick the best when we've got 30 of the best to choose from – that was only one of the dilemma's our judges faced with this year's Awards.

When the contenders are brilliant, choosing just one of them is almost impossible. When they're 'ordinary' (that's a relative term, for our Finalists could never be considered ordinary), they're usually

all in the same league, and picking the 'standout' is just as difficult. Can't we just ask the manufacturers to time their R&D efforts so each one gets a turn at standing out from the crowd each year? Couldn't we have had the IBM AT released in the same year as the Tandy TRS80 and others of its era, the Macintosh released alongside the Sinclair ZX80 and the Commodore PET, the Compaq 386 competing with the IBM PC and the Z80 machines which surrounded it?

Then judging would have been easy, surely? Or do we just have the benefit of hindsight? Maybe an AT with absolutely no software base wouldn't have looked so good against a real-world, working TRS80 with hundreds of 'business' programs available for it! Never mind – the thought of yet another type of judging dilemma is starting to terrify us. Let's just accept our lot and get on with the judging of this year's crop.

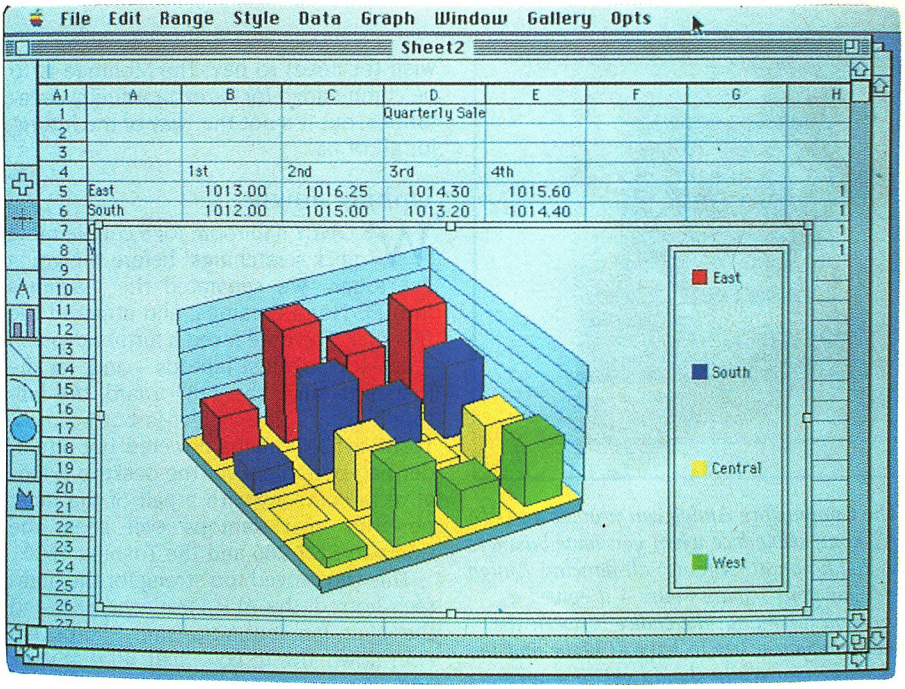


***Personal Computer of the Year** – the Toshiba T5200 is proof that you can get the full power of a desktop into a portable package. It's one of the most powerful PCs on the market, and you can just pick it up by the handle and stroll onto the plane with it!*

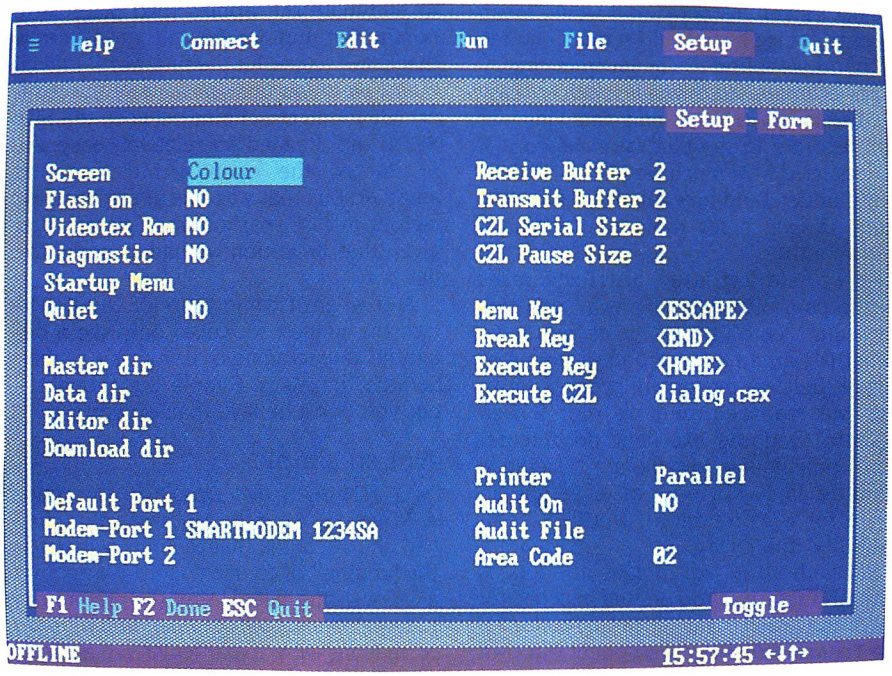
The Eliminations

AS USUAL, we found it easier to cross out the 'losers' (another relative term – how could anything which made it into the finals in such esteemed company be called a loser?) than to tick the winner. We sped through the early deliberations, agreeing on several contenders which could be eliminated from each of the categories for one reason or another, before we came to the grinding almost-halt of the nearly final showdown.

Each of the judges was able to come up with a reason why this piece of hardware



***Software Product of the Year** – but, is Wingz a spreadsheet, a word processor, a presentation tool or a charting/graphing package? Score another one for the Mac!*



***Australian Software Commendation** – Cybersoft's Gateway (with a programmed front-end) will be familiar to many as Telecom's Desklink. It brings mainframe electronic mailbox communications out of the dark ages and into the eighties. Gateway is an open-ended package with a huge future and is one of the great success stories of Australian PC software publishing. It took our Commendation without challenge – NetComm also needs to be congratulated: the two-time Australian Hardware Commendation winner backed the development of Gateway all the way, and bundles it with its modems (as pictured).*



The Commodore Amiga can provide an IBM AT-compatible face when you have business to do and an all-singing, all-dancing Amiga side for your leisure hours – it solved a problem for many: the choice between the machine you'd like to have at home and the machine you really should get so you can take some work home with you.

or that piece of software couldn't win, but after gleefully scratching their names off the list ('gleefully' because it would mean an easy choice if we could scratch enough of them) we found it was far from over.

For example, we found it relatively easy to dismiss LANTastic and the Montage film recorder in the hardware category. If you realised how much we like LANTastic, you'd understand how relative that 'easy' really is (watch for more on LANTastic next month).

As we said last issue, LANTastic takes all the pain of networking away, and this particular 'cure' hardly costs you anything! It's an amazing product: simple to install (hell, *we* managed), even easier to use (we managed, and we didn't even have to read the excellent documentation), ridiculously low memory overhead (as little as 40 Kbyte for a server, and 15 Kbyte for a workstation), NetBIOS compatibility, and cheap.

But with all its advantages, the judges felt LANTastic was too limited in scope for the broad brush of the Software Product of the Year award. While we bought our own LANTastic network kit during the year, we somehow doubt its relevance to a majority of YC readers.

The same fate befell the Montage film recorder: the 4096 by 2731 pixel resolution Montage brings quality film recording for graphics-based presentation to both the Mac and the PC worlds at a realistic price, but it's still a price few of our readers will wish (or need) to pay. The Montage is to be commended for its extraordinary capabilities, but it's not the 'way of the future' for all of us.

Uphill, slowly

WE ONLY had room for a couple more 'quick scratchings' before the going got tough. We separated the machines into PC/Non-PC camps, and attacked the PCs first. There we faced a further division – desktops against laptops – and, for the first time since the 1985 award, the laptops won. The 'feet-in-both-camps' Toshiba 5200, mains-powered but shoulder-bag portable, kept the desktop hopes alive in company with a pair of the most powerful 'real' laptops ever seen, the Compaq SL/T 286 and the Toshiba 1600.

This trio proved too strong for the high-tech hotrod, the ALR FlexCache 386, and the plain-Jane-but-surprising Philips AT. Four down, five to go... hell, all that work and the scratchings are still outnumbered! We turned our attention to the Non-PC camp, hoping to find an easy time of it. We should have known better.

On purely clinical grounds we were able to eliminate the Apples (two Macs were nominated, but we figured we'd narrow that down to one for the final battle, which is why we count them as a single contender). We found the choice between the Mac SE/30 and the Mac IIcx relatively easy: the SE lacked the open architecture and standard bus that was one of the deciding factors in last year's Mac II victory, and given that limitation we had to prefer the IIcx.

And when it came time for the IIcx to face the judges, we could only see a delightful re-packaging of last year's winner. Scratch the Macs. Simple, we thought – but you don't believe that, do you?

Not so simple

NOTHING'S *that* simple in this business. Scratch the Macs was our 'clinical' choice, but is that the only way we do the judging? Of course it isn't! We agonise a lot over this award. After the preliminary judging session, we come up with all sorts of reasons why a particular 'scratching' may have been wrong, until we convince ourselves.

Further into the judging process, we play some 'judges' games', like posing these two (among several other) questions: 'Which machine would you pick from this group if the boss gave you a blank cheque to buy a new work machine?' and 'Which machine would you



Corel Draw brings the power of Mac drawing packages to the PC for the first time.

pick from this group if you had to go out and buy it for yourself?' We ask this not only of the judges, but of anyone else who happens to walk by, and of people we're talking to out in the 'real world' or on the telephone (it's interesting how different some of the individual responses to these two questions can be, depending on who's funding the purchase).

The Mac got a lot of votes, in both categories. At least we were happy about one thing – the 'voters' always picked the IIcx. We agonised, debated and played devil's advocate with each other, pointing out all the reasons why the delightful Apple should win. Finally, we agreed – it's of a winning calibre, but it's not the winner.

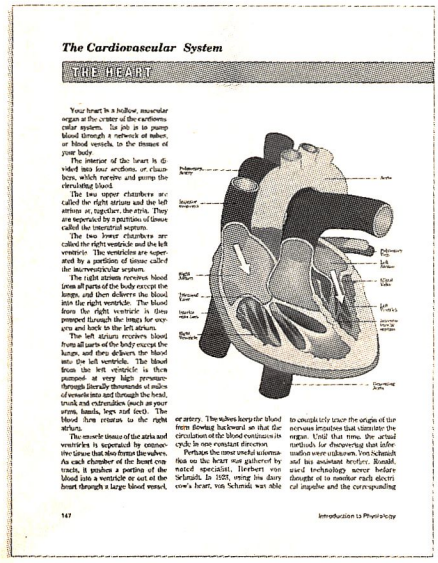
As we point out each year, the PC of the Year is not necessarily the one you'll want to own today – it's the one which most shapes the 'machine of your future'. These questions also brought up an interesting insight into the Commodore. It hardly ever scored when the boss was paying, but emerged as a popular and practical solution as a personal purchase.

The 'have your cake and eat it too' Commodore – which provides an IBM AT-compatible face when you have business to do and an all-singing, all-dancing Amiga side for your leisure hours – solved a problem for many: the choice between the machine you'd like to have at home and the machine you really should get so you can take some work home with you.

In that role it's an ideal machine, and it really is innovative – yet it is a solution for

the problems of the past and present, not those of the future.

And our little 'poll' highlighted something we've suspected all along: 'real' business doesn't need this dual identity, especially when the Amiga is still lacking somewhat in the serious software arena.



The Cardiovascular System

THE HEART

Your heart is a hollow, muscular organ at the center of the cardiovascular system. Its job is to pump blood through a network of tubes, or blood vessels, to the tissues of your body.

The interior of the heart is divided into four sections, or chambers, which receive and pump the circulating blood.

The two upper chambers are called the right atrium and the left atrium or, together, the atria. They are separated by a partition of tissue called the interatrial septum.

The two lower chambers are called the right ventricle and the left ventricle. The ventricles are separated by a partition of tissue called the interventricular septum.

The right atrium receives blood from all parts of the body except the lungs, and then delivers the blood into the right ventricle. The blood from the right ventricle is then pumped through the lungs for oxygen and back to the left atrium.

The left atrium receives blood from all parts of the body except the lungs, and then delivers the blood into the left ventricle. The blood from the left ventricle is then pumped at very high pressure through literally thousands of miles of vessels into and through the head, trunk and extremities (such as your arms, hands, legs and feet). The blood then returns to the right atrium.

The muscle tissue of the atria and ventricles is separated by connective tissue that also forms the valves. As each chamber of the heart contracts, it pushes a portion of the blood into a ventricle or out of the heart through a large blood vessel, or artery. The valves keep the blood from flowing backward so that the circulation of the blood continues in its cycle in one constant direction.

Perhaps the most useful information on the heart was gathered by noted specialist, Herbert von Schmidt. In 1929, using his dairy cow's heart, von Schmidt was able to completely trace the origin of the nervous impulses that stimulate the organ. Until that time, the actual methods for discovering that information were unknown. Von Schmidt and his assistant brother, Ronald, used technology never before thought of to monitor each electrical impulse and the corresponding

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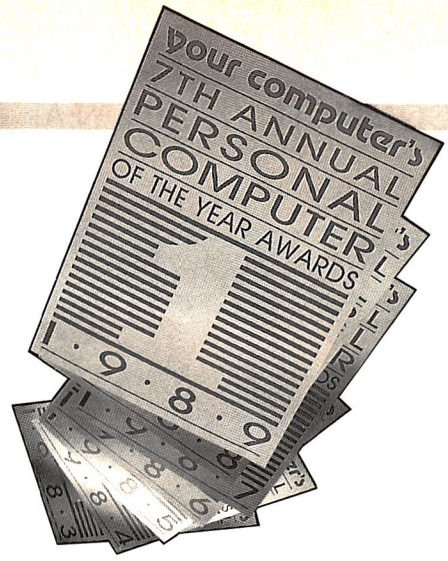
Introduction to Physiology

Adobe Illustrator soared to new heights in the significantly extended 88 version. And – a new release for the PC (although missing the blends, patterns and colours of the Mac version) brings power to 'that side of the fence' that we haven't previously seen.

The Amiga 2500 is innovative enough, clever enough, good enough, impressive enough to be the Personal Computer of the Year – but it isn't necessary enough. It's more a solution for Commodore than for its customers (the release of the Unix-based 2500 UX towards the end of the year should change that, however).

So, the 'portables' have it then, do they? Well, the timing didn't quite happen the way it sounds here, as we carved them up concurrently with the 'disposal' of the Amiga. But that makes for a complicated story, so we'll pretend the final-four-countdown was more orderly and put the Commodore aside as we move on...

Phew, only three to go, the hard part was over. Nope, you guessed it – it was just beginning. How the hell were we supposed to pick between these three 'mighty mites' – the Compaq, a masterpiece of packaging, with a fast 80286 and a VGA display; the Toshiba T1600, a more conservative design with its own touches of genius and the lowest price; or the



Toshiba T5200, final proof that you *can* get the full power of a desktop into a portable package?

First, we turned to Matt Whelan, who really *uses* a portable, travelling backwards and forwards to Asia and Europe on the seminar trail: 'Er, um, er, jeez, I dunno!' was his first response. We let him think a little longer, and he came up with this reasoned reply: 'Oh, I'd be happy with any of them. No, I'll take all three!'

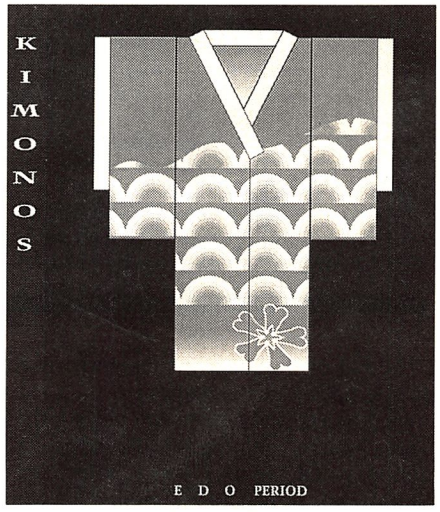
That wasn't good enough, we decided. He wasn't getting out of it that easily. Try again, Matt: 'Well, I currently travel with a Toshiba 5100 because none of the battery-powered machines before these two was powerful enough for my liking. Now I'm completely torn apart – I lust after the speed, VGA graphics, keyboard, expansion slots, and 100-megabyte drive of the T5200; and I love the weight and battery power of the littlies.

'The Compaq is a genius piece of packaging, so tiny when folded up you can't believe what's inside, and it even fits comfortably on an aircraft tray-table. Solid as a rock, and so smooth to just slot into its expansion module when you get back to the office.

'With all that, I still find the T1600 hard to go past. The nicer keyboard makes up for it being non-removable, the 20 per cent lower price well and truly makes up for its EGA-only display (did I really say that? 'EGA-only' is a put-down for a laptop? Wow, have things changed!), and its twin batteries make a lot of sense.

'I can't believe I'm saying this after doing the same last year, but the Toshiba feels more 'comfortable' for me. As long as the 40-megabyte version turns up soon, as promised, I'd have to take the T1600 out of these two.

'Of course, that's assuming I'd settle for a '286; the T5200 makes me drool even if it is bigger and heavier and more expensive. Can you believe it – one of the most powerful PCs on the market, and you just pick it up by the handle and stroll onto the plane with it? Wow! It's strong enough and well-equipped enough to be a file server on a big network, and I can take it with me? Hang the expense, I'll take it!'



Aldus Freehand plays Adobe at its Illustrator game and throws in some extras – version 2.0 is a knockout!

Bought the company

MATT'S Toshiba bias hasn't come from being an owner; it's come from being a PC of the Year judge. After deciding he preferred the T5100 to the Compaq 'lunchbox' in his first encounter with them, last year's judging, he refused to return the Toshiba.

Even though he helped vote it out of PCOTY contention, he kept the machine and sent Toshiba a cheque. He used it extensively while travelling, and at home ('when I travel out to the lounge room to work'), even though his study is also kitted out with an option-filled President 20MHz 386 tower, and a Mac II ('yes, the Mac II also came *after* last year's judging').

He's falling into the same pattern this year. Problem is, his mind may well snap before he can decide whether to: 1) sell the President and the 5100 and buy the 5200 for all his DOS-based work; 2) sell the 5100 and buy a 1600 for travelling, using the President for his 'power' work; or 3) lay low and wait for a '386 version of that beautifully packaged Compaq. ('Fellas, you forgot something – I gotta get a IIcx in in place of that worn-out old Mac

The Rules

AS WE EXPLAINED last issue, the 'rules' for eligibility in the Personal Computer of the Year awards have changed this year, for the first time in the event's history. Prior to, and including, the 1988 award we judged only machines released (and sold in a specific quantity) during the previous calendar year. While the calendar year made a nice logical division, however, it wasn't particularly sensible: new, advanced machines released before the awards were announced weren't eligible.

Many machines released in the US late in the year didn't make it here in sufficient quantity to qualify, while a rash of newcomers around the time of the PC shows at the start of the new year also missed out. Problem is, these often brilliant machines could be 'superseded' by the time another long year rolled around and they finally got their chance.

This year we decided to do things a little differently, to make the awards more up-to-date and meaningful. To be eligible, a product can be released at any time up until the day of the award announcements – that is, the day this issue goes on sale with the announcement in it (our function where we present the awards is usually on the same day). And our definition of 'released' means the machine must be available for purchase.

Manufacturers and importers will have to be careful about the new award timing, lest they still miss out. While a machine or software package released in the final month of the award period is eligible, it's of no use to us if we don't know about it. They will have to keep us well advised of its impending release, and provide pre-release versions for testing and judging purposes.

As long as we have a firm commitment from them that the unit will go on sale in time to qualify, we will accept unreleased product for judging.

II,' he babbled almost incoherently from his straitjacket in the corner.)

We argued and agonised, played the judges' game, did the devil's advocate routine, rated them on fancy pointscore charts, and argued some more; all the while looking into the corner for signs of either a decision or the final 'snap'. We were getting there. 'Toshiba,' we called out; the head in the corner bobbed up and down, the eyes smiled, but foam flecked the lips. We assumed he agreed.

'Monster power in a tiny package; laptops finally catch up to the best of the desktops; way of the future,' we yelled, watching for the signs. The eyes in the corner glazed, the head rolled to the side. We thought we'd lost him, but then the foam gave way to that familiar drool: 'Yeth!' he said, and slumped into unconsciousness.

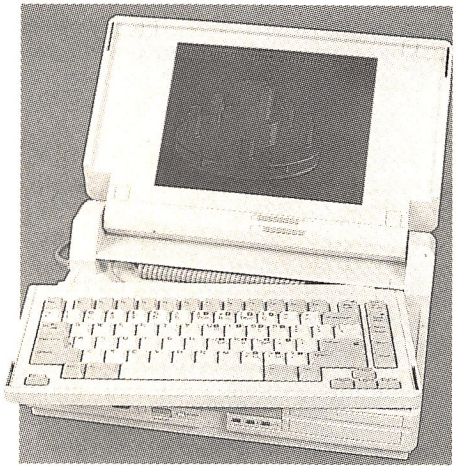
The first 1-2 form-finish in the history of the Personal Computer of the Year awards was sealed into the envelope!

What? More!

WE SURVIVED that and we still have to do the software? What did we do to deserve such punishment? Oh, how we wished for the balmy days of 1984, when Lotus 1-2-3 was the *only* software finalist. And it turned out even worse than we expected when, after the preliminary rounds, some late starters were accepted into the list. Additions included the amazing 'from nowhere to stardom overnight' Corel Draw and Traveling Software's LapLink Mac (finally, PC-Mac high-speed translation, controlled from the PC end).

We got our revenge by dismissing several packages quickly: while they were advanced enough to have made it to the list in the first place, they clearly wouldn't go the distance in the face of some of the stronger competition in this sector. We couldn't decide whether dBase IV or Clipper Summer 87 should be first to go, so to avoid offending Ashton-Tate and Nantucket we threw 'em out together, if for quite different reasons.

In the case of dBase IV, we couldn't honestly consider it based on version 1.0, and A-T ran late (so what's new, did we hear you ask?) with the 1.1 update. Great ideas, incomplete implementation; worthy of the award if 1.1 fulfills the dream, it will have to wait it's turn.



The Compaq SLT 286 is a masterpiece of packaging, with a fast 80286 and a VGA display (we still can't believe how small it is).

Clipper was a different story: over-ripe, rather than incomplete. Summer 87 (another late-starter, it didn't hit the streets until 1988) is the ultimate dBase language development toolkit, a powerhouse that has won the serious programming community over. But Nantucket is already making it sound a has-been by discussing the impressive plans for its multi-platform, multi-lingual, object-orientated replacement. Who are we to argue with the people who produce this thing we love so much?

Another dBase-related product, the dGE graphics package, also bit the dust at this point because of its limited overall appeal; despite its brilliance, despite the flood of phone calls we've had ever since we reviewed it in April issue, it wasn't going to hold up.

Those down, we scouted around for more 'easy marks'. We took out a scalpel and started slicing the list from the bottom. (Yeah, we're making it sound easy because we don't want to keep you reading for hours – this 'simple slicing' took us hours of, you guessed it, agonising and debate.) Unfortunately for them, we grouped operating systems/environments at the bottom.

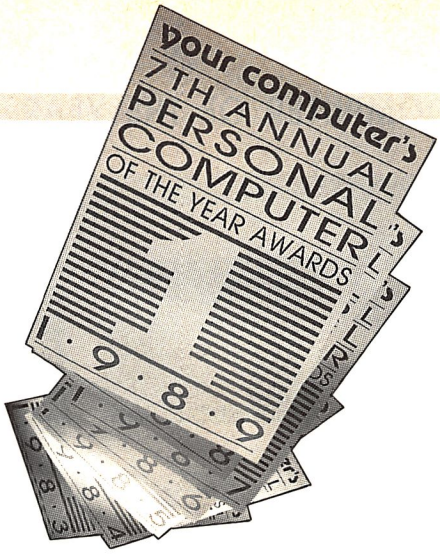
Concurrent DOS, Desqview, and PC-MOS (all in their '386 versions, which are then truly usable) all have their supporters at YC – problem is, it's violently partisan support. We could argue about which of the three we prefer for days, but they still wouldn't be as trend-setting and have the mainstream-appeal as others further up the list.

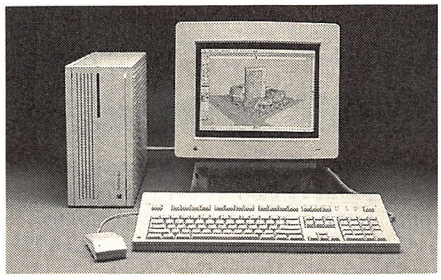
The black crosses

WE THEN decided to knock out updates on past finalists, on the basis that they could only be great, not both innovative (any more) *and* great. Put a black cross beside them, we decided, and come back later to check if it was unfair.

Ahh, that's better. Five black crosses out of the way, and we had a more manageable list. Pushed aside, for the moment at least, were PageMaker 3.0 (despite its beautiful cross-platform integration and extra power), Adobe Illustrator (both the Mac '88 version and the newer but less powerful PC version), Ventura 2.0 (despite significant advances), and Norton Utilities 4.5 (despite the argument that raged – we almost decided this deserved to win with new wonders like Norton Disk Doctor already having 'saved our bacon' yet again).

At this point we went into a huddle, emerging armed with a razor-sharp Samurai sword. The decision: chop the remaining list with a few well-timed and ruthless swishes – Adobe Streamline, Course of Action and Digital Darkroom were carved out of the Mac list in the first swipe: all three were examples of genius programming, but their limited market scope let them down.





The Apple IIcx is a delightful re-packaging of last year's Personal Computer of the Year.

The return sweep took out an equal number of PC products: MicroGrafx Designer, Corel Draw and Draw Applause. If you live in a PC-only world, these are outstanding packages – but, sadly, they just couldn't match the competition from the Mac side of the judging table. The Mac lead in drawing/graphics-based packages may have been cut back to 12 months, but it's still out front and running hard.

This left a single slipcase binder standing on the IBM side of the table, facing off against four stunners for the Mac. The odds weren't in Lotus Agenda's favour, we can assure you. Especially when the judges switched from the Mac back to the PC and turned their noses up at the user interface.

Lotus 1-2-3 had a great new user interface in its day, but that day is long gone. To see Agenda, a powerful information-management tool clearly suited to a wide world of still-computer-illiterates, display

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You can even change your mind, delete and then restore, right back to your commencement point if necessary by utilizing the undo or redo commands.

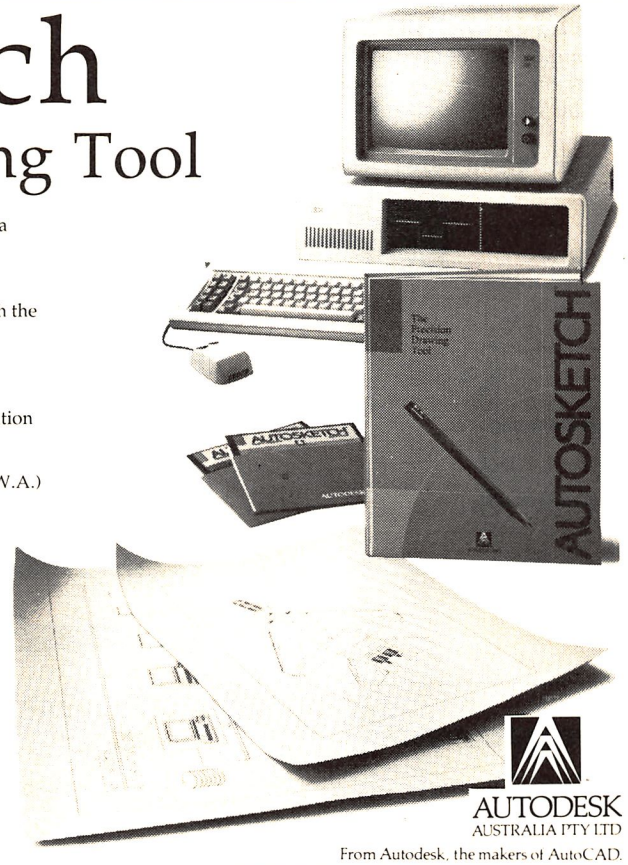
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an unfriendly Lotus-menu and function-key interface in this 'enlightened' era is a shame. (We knew we were in trouble when it took one of our computer-wise judges a week to notice you could actually have colour instead of mono.)

Agenda is a good example of an emerging breakthrough for personal computing, but it isn't *the* breakthrough. (Matt regained consciousness for long enough to suggest he'll probably try using Agenda 'for real' on his Toshpaq 5216, but we're not sure how long he'll last).

Back to the Mac

A THREE-WAY contest on the Macintosh? That's starting to sound more comfortable. Wait! We demand a re-count – by our reckoning there should be four packages left. True, but the judges slipped another one out of the way as soon as they grouped on that side of the table.

Aldus Freehand 2.0 is state-of-the-art in drawing packages, of that there's little doubt, but draw-power is not news on the Macintosh. While Freehand can arm-wrestle the original champ, Adobe Illustrator, to the ground it can't claim to be as new and vital as the other three. Persuasion, also from Aldus (how can one company have three such brilliant packages, all still fresh and competitive?), lined up against direct competitor More 2.0 with a dark horse lurking in the background in the form of the Wingz spreadsheet.



The Philips AT introduces the mass storage of CD-ROM to the PC user – a fact that is going to revolutionise personal computer use. Just think of the possiblities with 600 megabytes on a floppy-sized disk!

'Spreadsheet! *Spreadsheet?*', came a high-pitched wail from the corner, 'get it *and* the beancounters out of this office before I go crazy!' We couldn't move them quickly enough, so we just called the white-coated men in to wheel him away. We're not known for our love of spreadsheets around the editorial office. The last time we used one in anger was an early VisiCalc on the Apple II – it told us our new baby, *YC*, was going to make a profit so we went straight out and spent the money before we had it.

Spreadsheets also suffer by association. They're the tool of those nasty people who are always trying to keep our wages down and hours up. Who want us to print a (16)-page – those brackets are spreadsheet-talk for minus-sixteen – magazine in (8) colours. Who would prefer if you just sent your subscription money in with a note saying you didn't expect anything in return.

Nah, a spreadsheet could never win. Well, not *twice,* anyway!

The presentation packages were much more our style. This is the year of 'desktop presentation' we have been told numerous times. A whole host of packages have sprung up, both on the PC and the Mac, but these two represent the cream of the crop. Colour, graphics, interactive, multi-screen, template-based presentation, outlining... they have so many features you can prepare a presentation in (5) minutes – if you'll forgive the spreadsheet talk.

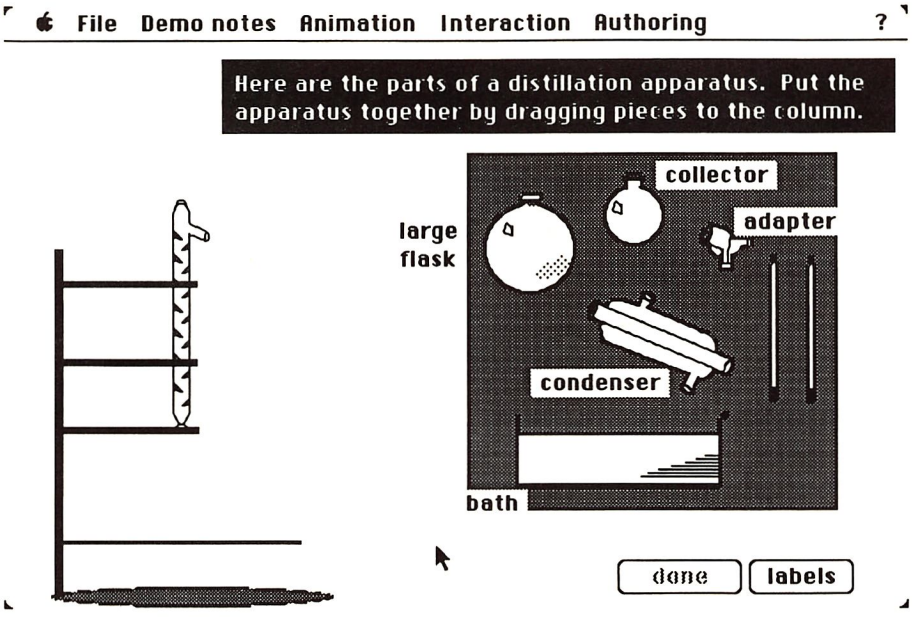
They're stunners, both – bang in an outline (they're power-outliners at heart), hit a button, and you have a rolling slideshow of graphic charts and overheads, slides, or printouts. Devote a little time to either of them, and you have an awesome presentation tool. Draw and import on individual slides, use a graphic or text-control template, and after a day or two you're the most professional presenter in the company.

With little play-learning and absolutely no reference to the manuals, the judges' More and Persuasion camps had soon prepared rival presentations, extolling the virtues of 'their' product.

Sheet spreading

EVERY SO often they'd stop trying to convince each other, and fire up Wingz for a look. Yes, it looked like a spreadsheet, but what about those drawing and graphing tools? And the 3D, and the colour-mixing, and the full font control and text editor, and the scripts that looked like a complete programming language?

Hmm. Interesting spreadsheet – you could almost do a presentation with this product, too; but with live figures in the graphs and active information, not just last Friday's sales numbers. And look at these demos: a full menu-driven, push-button interactive look at the system; impressive.



Course of Action is a brilliant Macintosh program designed for trainers developing courseware (new buzzphrase: 'desktop authoring'). To quote an expert in the field: 'Course of Action does for learning what desktop publishing did for the business world.'



We hit the Mac screen's power switch – they were wheeling Matt back into the room, and we didn't want to send him off the deep end. Were we in for a shock: 'Hey, this Wingz sounds interesting,' he dribbled, and our jaws dropped. Completely gone, we assumed. 'No, listen, I was just talking to John Green – Lotus and Excel trainer of much fame and editor of Spreadsheet Advisor newsletter – and he told me some amazing things about it. We'd better take a closer look.'

We shrugged and turned the monitor back on as Matt rambled about talking spreadsheets, pointing at maps and getting sales figures by region and by site, about the wonders of Hyperscript programming ('John says it's a real language; more, much more than just spreadsheet macros') about colour presentations, completely customised menus, object-orientated graphics, slideshows, even desktop publishing.

We figured he should be wheeled away again, but we let him ramble. And, as we dug around, all these things did appear. Along with buttons which called complete hyperscript applications from a single spreadsheet cell, consolidating multiple spreadsheets by pointing and clicking, import and manipulation of clip-art and graphics, database storage, built-in spreadsheet auditing, multi-level password-protection and data encryption.

Our indoctrination was complete. Wingz was hovering head and shoulders above the rest. The mark of a true Software Product of the Year.

Australian Commendations

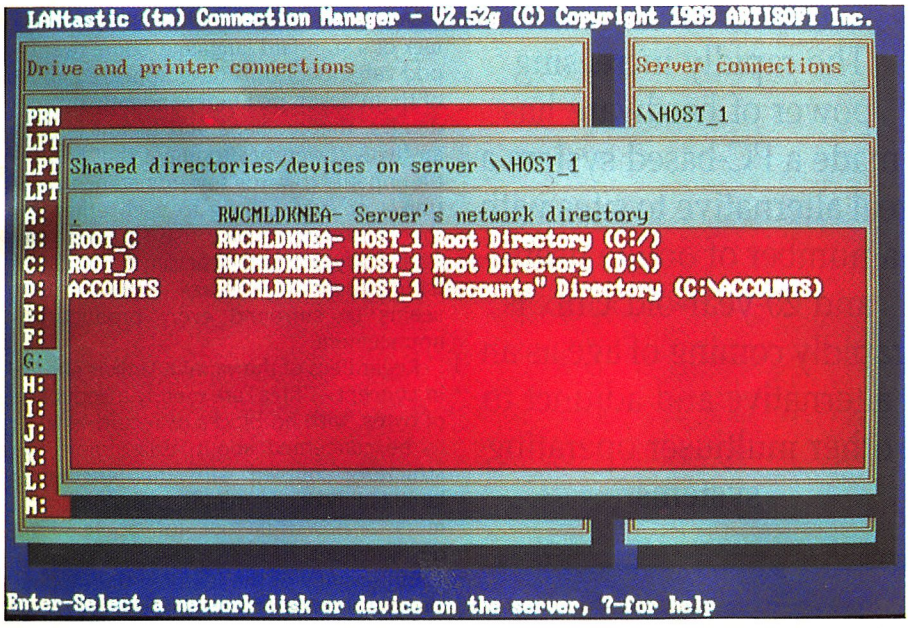
THERE WAS one other finalist, although we never mentioned it as such; we let it have a table of its own, representing Australian software. The temptation to let Australia mix it with the world's biggest and best for the first time in the Awards' history was very strong, but we resisted.

Cybersoft's Gateway V3 is a communications program which matches it with the best in the world and, in its own niche, wins. Its user interface makes Lotus Agenda look stale, and its inbuilt programming language matches the power behind Wingz. Doug Scadlock, Heath Rogers and the team closeted in the inner-city Sydney suburb of Ultimo have developed not only a comms program with class, but also a comms 'engine' and language which allows for totally customised vertical market applications.

Telecom's Desklink is Gateway with a programmed front-end; it brings mainframe electronic mailbox communications out of the dark ages and into the eighties.

Reader's choice

THE RESPONSE TO our request for reader's to nominate their own choice of hardware and software products, led to such a deluge of nominations, that we have had to hold the story over until the July issue, although the actual winners will be announced at the PCOTY awards on the first of June. Some of the nominations (and reasons for them) are surprising – the lesson for developers seems to be to keep it simple, quick and straighforward. It's edifying to learn there are so many *thoughtful* users out there. Watch for the story next month.



LANTastic takes all the pain of networking away: it's simple to install, even easier to use, has ridiculously low memory overhead (as little as 40 Kbyte for a server, and 15 Kbyte for a workstation), NetBIOS compatibility, and the price is right!

An open-ended package with a huge future, Gateway is one of the great success stories of Australian PC software publishing. It takes our Commendation without challenge, and with the knowledge that it couldn't have been pushed out of the main award section without a strong fight.

At this point we also should congratulate NetComm Australia for yet another advance: the two-time Australian Hardware Commendation winner backed the development of Gateway all the way, and bundles it with its modems.

This will be some consolation to the company when it hears that we don't have a hardware Commendation this year. When NetComm's only opposition in this category dropped out by missing its release date, the judges decided a no-contest was no contest.

They agreed they would have no problem with a clear decision based on superiority over the opposition (as was the case with Lotus in 1984), but not one in which there was no opposition. So NetComm, the shining light of Australian communications hardware, misses out through no fault of its own. But we just know it will be back next year... □



The Grep of Unix

The rapidly increasing power of hardware has made a PC-based system a real alternative to sites with a number of online users – and 20-year-old Unix is rapidly coming of age as an alternative and adjunct to other multiuser operating systems.

OPERATING SYSTEMS for microcomputers over the past decade have been predominantly proprietary: MS or PC-DOS running on IBM PCs and compatibles has become the de facto standard for a single user, single task environment, while TOS for the Atari range, AmigaDOS, AppleWorks, various implementations of CP/M and sundry other operating systems have made their mark, generally within a single 'proprietor's' range of products.

Now we are seeing the emergence of Unix as a standard multiuser, multitasking operating system. Its portability across different manufacturer's systems and its strong communications and systems development facilities make it a leading candidate for selection by 'multi' (user, site, vendor and national) organisations.

The Unix operating system was developed at AT&T's Bell Laboratories in the early 1970s. It was written in C (as are most Unix applications), but there has been no C standard. This has meant that as applications were ported from one machine to another, it was often necessary to make major, time-consuming changes to the source code (there is now a draft ANSI standard for C). Primarily because of the lack of a standard language, some twenty-odd variants of Unix have appeared, most of them developed independently by academics, theoreticians and technicians in an 'ivory tower' environment that had little impetus towards towards standardisation – or even talking to each other, for that matter. This gave rise to the somewhat confusing aura of acronyms, multiple 'standards' and release numbers that seems to surround every product announcement.

Regardless of the variant, Unix is simple in concept – 'files' are merely a sequence of bytes, with no blocks or record lengths to be concerned about; this simple file structure, coupled with the language's large family of commands, offers programmers a powerful tool for applications development.

But – many of the features that appeal to programmers and developers, are those that have given Unix its reputation for unfriendliness and suitability only for 'technical' computing. For example, the large number of commands and qualifiers (al-

Sourcix

AS MENTIONED in the main story, every large computer vendor in Australia now offers a Unix 'solution'. But for detailed information on Unix and how it might be used in your business, we suggest you contact the following –

Blue Sky Industries,
2a Blakesly St,
Chatswood 2067 NSW
(02) 419 5799

Computer Additions (Bell Technologies),
20 Waltham St,
Artarmon 2064 NSW
(02) 438 1266

Hewlett-Packard,
31 Joesph St,
Blackburn 3130 Vic
(03) 895 2895

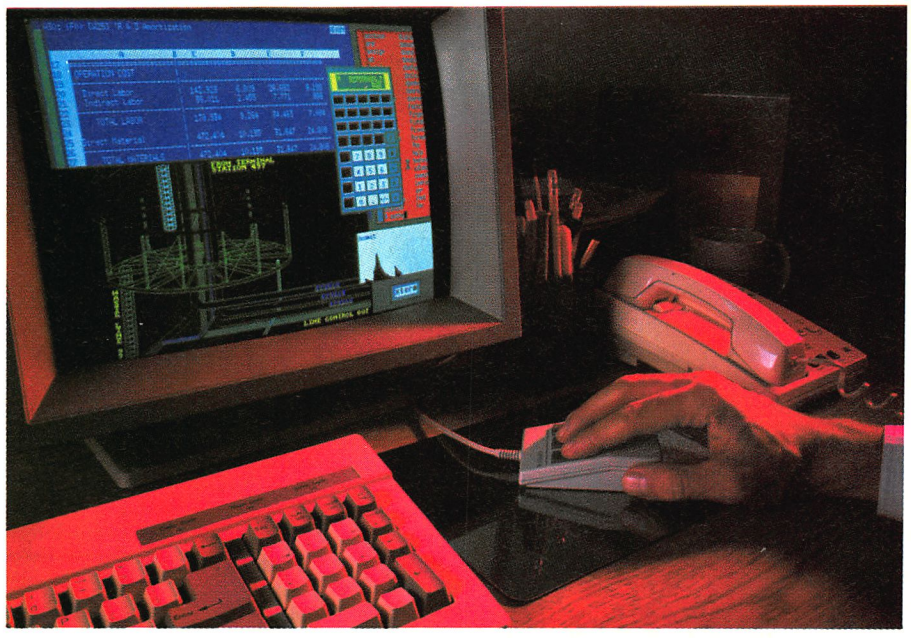
MPA International,
101 Whitehorse Rd,
Blackburn 3130 Vic
(03) 894 1500

NEC Information Systems,
99 Nicholson St,
St Leonards 2065 NSW
(02) 438 3544

Oracle Systems,
90 Mount St,
Nth Sydney 2060 NSW
(02) 959 5080

Softway (MacIdris),
120 Chalmers St,
Surry Hills 2010 NSW
(02) 698 2322

Stater Computing
(Interactive Systems),
133 Alexander St,
Crows Nest 2064 NSW
(02) 436 0737



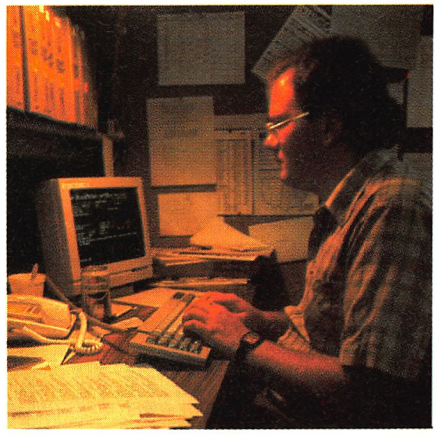
Recent hardware advances such as fast 80386-based machines, intelligent multiport cards (which free the main processor from the drudgery of remote terminal management), and fibre optic cables with their ability to transmit bit-mapped graphics, have made a PC-based Unix system a practical alternative for multiusers systems.

most three times that found in DOS), added to the cryptic appearance of most of them, can be intimidating to newcomers. As can the terse syntax of the command language ('shell') and the fact that most commands act silently – there's no 'Are you sure?' crutch in Unix.

Operating systems manage the flow of electronic information between the central processing unit (CPU), random access memory (RAM), disk drive storage, keyboard and screen displays, and the flow of information to other computers and peripherals such as printers. It is quite distinct from applications, such as word processors or databases. The operating system comes first – it is the mediator between the application software and the computer hardware. This will no doubt be familiar to PC users who have used the DOS command line and even to those familiar with the Macintosh with its File Finder, System and mouse/icon interface, which makes the operating system transparent to the user – but it is still there, in the background, working away.

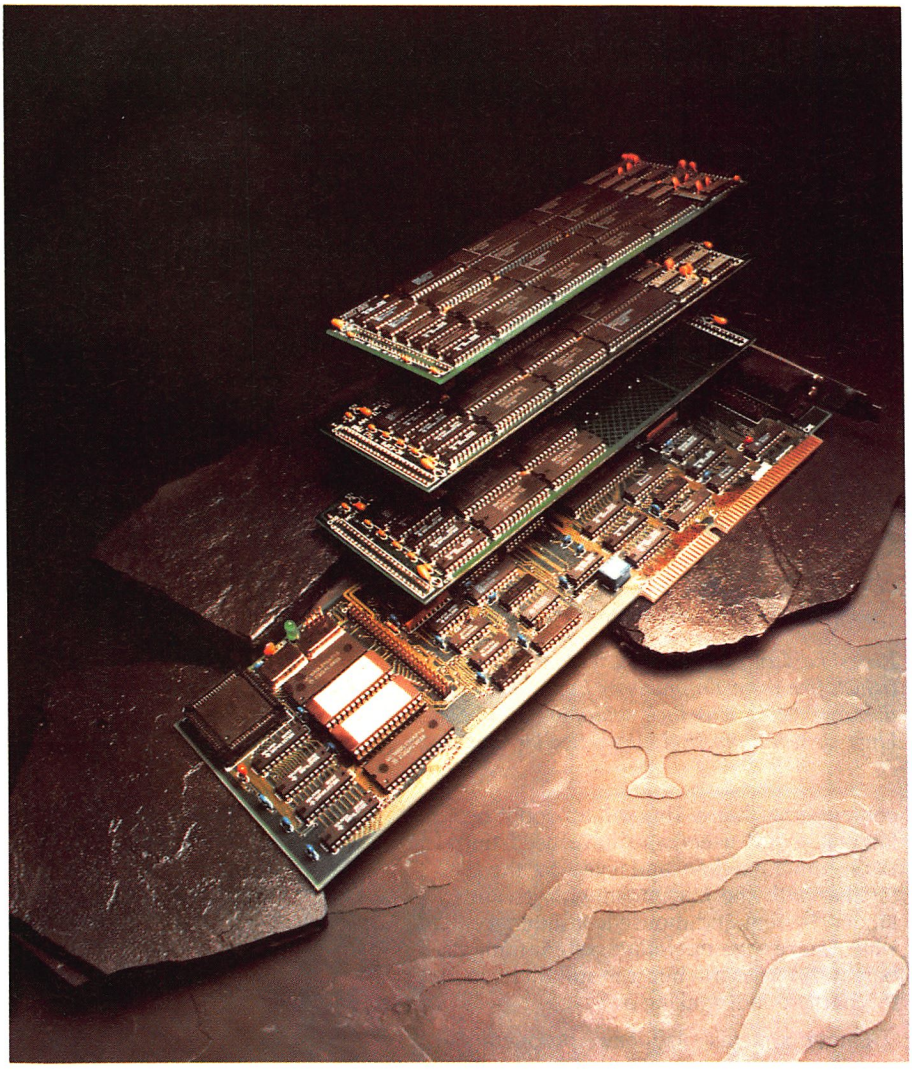
Larger systems also have proprietary operating systems – VMS for DEC's VAX range, and SAA/SNA for IBM mainframes. Unix differs from all of these in that it has been designed to run on a wide range of hardware, from mainframes to PCs, regardless of the manufacturer. It would be going too far to describe it as a universal operating system, but that is the line developers are taking with Unix. Although there are currently different versions available for mainframes, minis, IBM PC/ATs and compatibles, 80386-based machines, the Macintosh (A/UX and MacIdris) and others, within the next several years we will see an 'open' system, complete with windows and an interface that obviates the need to ever face the command line.

An open system has impressive advantages for users. For example, software can easily be transferred from one type of computer to another, so that if a company purchases new hardware, it doesn't need to replace the existing software; this also



Telnet is a VT 100 terminal emulator that allows users to run a DOS program in the foreground and be logged on to a Unix system in the background, and switch between the two at will.

reduces re-training and maintains productivity. And, it eliminates 'lock-in': if you buy a vendor's machines equipped with a proprietary operating system, you are locked-in to buying that vendor's software; and then, after a few years, when you would need a new/bigger/faster system, your investment in software, data files usable only with that vendor's products, and user training has become so large



Anvil Design's ONBoard2 range of intelligent serial I/O communications boards allows up to 64 terminals and 64 printers to run on 80386 systems. Using Anvil's own expansion bus architecture, a single AT-expansion slot can can be figured with 4, 8, 12 or 16 ports. The boards have their own 80186 processor to handle terminal overhead, freeing the main processor from those tasks and allowing a throughput of about 300Kb/sec.

Uneeds

IF YOU ARE considering Unix for use in your business, once you have decided on the applications, the choice of software is fairly straightforward. As an indication of prices, System V is priced from $1200 to $1500 (depending on the CPU the system will run on), Microsoft Word is around $1000, Multiplan, $900, and a relatively complete 'solution', SCO Office Portfolio, $3700.

Deciding on the hardware is somewhat more complicated, but the following rules of thumb (which are used by many dealers) should help determine a starting-point configuration: assuming a 32-bit server, the number of users that can be supported is equalto the CPU clock speed – for an 80286-based machine deduct 25 per cent from that); if the server doesn't have CPU caching, deduct a quarter; if the server's processor is Intel's stripped-down 80386SX, deduct another quarter. Now, count each user whose primary activity is word processing or using a spreadsheet, twice. Don't forget to add the cost of a terminal for each user, if you are doing a rough costing.

You need to allow at least 2 megabytes of RAM for the operating system and about half a meg for each user, or you'll soon have 'not enough memory' problems. And, allow at least 10 megabytes of hard disk space for the operating system itself – that means the minimum hard disk you should consider is probably around 80 megabytes, especially if your business is in 'a growth situation', as the consultants put it.

that you're now locked-in to the vendor's latest offering. This can be a very expensive solution because, one, it's unlikely the vendor will be able to realise the economy of scale available to more broadly-based products, so you pay higher prices, and, two, there's no reason for the vendor to keep his prices down – after all, you're locked-in.

Recently, interest in Unix has gathered pace, and it has become a significant market concern for the major computer companies throughout the world. Unix is now twenty years old and has an installed base of over one million users – this has given many large corporate users first- and second-hand exposure to the advantages of an open-system approach. Plus, other vendors have noted the success that mainframe suppliers Fujitsu and Amdahl are enjoying through their early implementation of Unix. In fact, every major computer seller in Australia today offers a 'Unix solution'. The Queensland government is re-equipping its computer centres with a Unix-based system and the New South Wales government is moving in the same direction. The US Federal government specifies compliance with a Unix standard and has requested tenders for over $US1 billion worth of Unix harder and software.

Price, power and Posix

ESSENTIALLY, THERE are three reasons behind the growing interest in Unix: price, power and Posix. As noted above, an open system tends to keep prices low, but that's only part of the story. Traditionally, those needing a multiuser PC system have implemented a network in which users each provide their own processing power; this is certainly not a multiuser system, but the choice to gain a true multiuser environment was to invest in a minicomputer (and greatly increase the cost of the system) or to use a PC as a file server (and greatly reduce the efficiency of the system).

In the last 12 months, however, a range

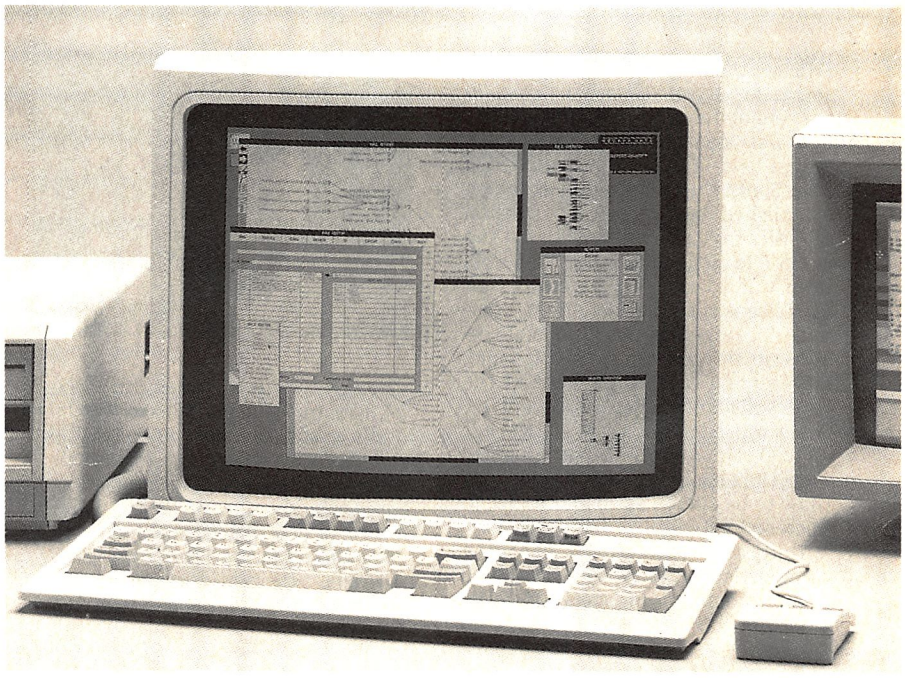
Unix for the Amiga

IN FURTHER enhancement of its image as a supplier of business machines and office solutions, Commodore announced at last November's Comdex that they will be releasing 'an operating environment' based on Unix System V, called AMIX, and a new workstation, the Amiga 2500 UX.

The 2500 UX is based on the 2000, but (in the configuration shown at Comdex) adds an 80 megabyte hard drive with a rated average access time of 19 milliseconds, a 68851 virtual page Memory Management Unit (MMU), a 68881 maths coprocessor, 5Mb of RAM (1Mb of chip memory and 4 of 32-bit RAM) and a 150Mb integral tape drive. The CPU is a 14-.3MHz 68020, with upgrades available to 25MHz. As shown, AMIX – an implementation of Unix System V 3.1 – includes word processing and software development tools, including a Motorola C compiler specifically developed for the '020 and '881.

Commodore engineered AMIX to take full advantage of Amiga features such as the blitter chip and custom graphics hardware, freeing the main processor for applications. Overall, the developers expect to see a 400 per cent improvement in processor performance over a standalone 68000.

Beta test units are now in the hands of third-party developers and the machine is expected to be released late this year. Commodore sources indicated that the release date had been put back that far because a suitable, intelligent multiport card with onboard caching wouldn't be available until then. The company indicated they expected to price the entry-level 2500 UX under $US5000.



Large screen, multiwindow displays are possible under Unix using Bell Technology's Workstation Graphics Engine (called the Blit Express for short), distributed in Australia by Computer Additions, (02) 957 4226. The Blit board is based on Intel's 82786 graphics coprocessor which handles the drawing of geometric objects and characters and maintains the bit map. A display processor on the board reorganises the bit maps generated by the graphics processor and displays i on the video terminal.

of fast 32-bit machines, has made the use of a PC as a file server a workable choice (the release of 80486-based machines and their like will make a PC-based Unix system *very* attractive for up to about 25 users). The result is that a full-featured, PC-based Unix system can be installed for about $4000 per user; a full-featured PC-based network takes around $6000; and, a minicomputer system, about $10,000 per user – even with only a few users, those differences become significant at decision time.

(Two points need to be mentioned: first, Unix – the name – belongs to AT&T, even though we are using it generically here for convenience. Second, users are looking for an open system, regardless of what it is – Unix just happens to be there, offering an elegant and mature solution.)

Other hardware advances have added to the viability of the PC-based Unix approach. Most significantly, these are intelligent multi-port cards with onboard caching that free the server from much of the drudgery of terminal management, and fibre optic cables with their ability to transmit bit-mapped graphics to link the server to colour terminals.

The twenty-odd variants of Unix will soon be reduced to two: release 4 of AT&T's System V which merges the Berkley and Sun versions with AT&T's (it's due for release later this year) and the Open Software Foundation's OSF/1 which will be based on IBM's own Unix implementation, AIX; OSF/1 is also scheduled for release later this year. Both of these versions will comply with the IEEE's specification for application program interfaces, called Posix, which is based on AT&T's System V. A user's decision between System V and OSF/1 will be determined largely by the current installed system – it's going to be a lot easier and cheaper to upgrade if you take the same path your current supplier has (this should be one of the last major example's of lock-in we see in the PC world).

(The Open Software Foundation, OSF, was formed by IBM, DEC, Apollo, Bull, Hewlett-Packard, Nixdorf, Siemens and Philips in reply to the predominance that AT&T, Sun and their allies were gaining in the Unix market, particularly the perception of their being development leaders.)

Posix has also been adopted by X/Open, a body originally comprising the major European computer manufacturers but much more widely-based now – even IBM has joined the group. X/Open has taken Posix as the basis of its Common Application Environment.

Benefix

THERE ARE other benefits offered by Unix that contribute to its increasing acceptance among those using PCs – in fact, that acceptance is itself a contributing factor to the success of PCs: a growing number of mini and mainframe users are opting for a PC/Unix solution to the problem of expensive equipment upgrades.

Also, most data processing depart-

A Desktop of Standards

THE VALUE OF worldwide Unix-based shipments is set to grow by over 20 per cent annually to 1992. This prediction was made at the SCO Partners Forum held in Sydney in March. SCO (The Santa Cruz Organization), which established itself marketing a version of Microsoft Unix, Xenix, is the world's leading supplier of Unix software – it provides 55 percent of all Unix licenses sold, according to company spokesperson Sam Spadafora; in 1988, it shipped some 90,000 units, representing over 70 per cent of the Unix software market. (Microsoft recently moved to buy up to 20 per cent of SCO, although both parties agree that Unix-based products will continue to be offered as an alternative to Microsoft OS/2.)

Thirty-five percent of the company's worldwide sales of $US60 million comes from operations outside the US, so SCO is keen to strengthen its presence in the Pacific.

Robert Michael, marketing manager for the Pacific region, outlined SCO's marketing plans at the Forum. At the core of the company's strategy are the Office Portfolio suite and Open Desktop, an integrated environment for '386-based workstations.

Office Portfolio offers a range of business applications and desktop productivity tools. It runs under SCO Xenix System V and SCO Unix System V on computers that incorporate the AT bus, EISA bus or Micro Channel Architecture.

The Office Portfolio suite ($3683) currently includes SCO Manager (a combination of electronic mail, calendar, calculator and intelligent clipboard), Lyrix (a full-featured word processor), Professional (a DOS-compatible, enhanced Lotus 1-2-3 workalike), Integra (an SQL-based relational database), ImageBuilder (for presentation graphics), Statistician (for statistical analysis), MasterPlan (a critical path-method project manager) and Accell (an application development tool for Integra). The applications are also available separately.



Open Desktop is a product that makes an industry-standard '386 machine into a universal workstation. It is based completely on standards – whether de facto, legislated or established by standards committees – that we believe are going to be the dominant system standards for the next few years – ***Doug Michels, vice-president and co-founder of The Santa Cruz Operation.***

Doug Michels, SCO vice-president and co-founder, said, 'The SCO Office Portfolio offers users of standard hardware unprecedented flexibility in integrating current and future office automation software. Other candidates for integration into the Office Portfolio include more than 2500 third-party applications now running under SCO Xenix System V.'

Open Desktop (jointly announced by SCO, DEC, Tandy, Relational Technology and Locus in February) integrates six 'mature' products into a single workstation environment for '386 machines –

Unix System V/386 Release 3.2, which provides binary compatibility with both Unix System V and SCO Xenix System V.

Motif, a graphical user interface developed by the Open Software Foundation (OSF) that provides the 'look and feel' of Presentation Manager; it includes DEC's XUI Development Toolkit for X Window-based applications. SCO and Microsoft indicated that Presentation Manager compatibility would be added next year using the PM/X API currently under development by Hewlett-Packard and Microsoft.

The X11 X Window System, based on X-Sight from Locus.

Distributed SQL relational database, a licensed version of Ingres/386 from Relational Technology.

TCP/IP and *NFS* standards for Ethernet and asynchronous network communications, providing access to Sun and OS/2 file servers.

DOS-UNIX integration is provided by Locus Merge 386 and PC-Interface; Michels claimed the Open Desktop 'could run every DOS application currently on the market.'

The hardware will be supplied by DEC, noted for its powerful workstations, and Tandy, a leading mass-production vendor and owner of one of the largest distribution networks in the world.

For further information contact –

Blue Sky Industries
2a Blakesly St,
Chatswood 2067 NSW
(02) 419 5799

Open Desktop is due for release in the third quarter of 1989. While prices have yet to be determined for Australia, SCO has announced US prices of $US995 for a two-user site and $US1495 for multiusers.

ments write many of their own applications. Finding, keeping and training programmers has always been a considerable expense – if there are twenty operating systems that applications are being written in, your chances of finding some one who knows the one used in your EDP department is much less than if there were only one or two; and, of course, those you do find, or train, can ask more for there services because of the specialised nature of their knowledge. Unix (and C) have the advantage that almost every graduate programmer has a thorough knowledge of them. Add that to the ease of application development in Unix, and there is a great saving in the cost of that development.

Another factor contributing to Unix' embrasure by medium-sized businesses – in many ways the industry's software leaders – is the general uncertainty in the market place caused by the rash of litigations amongst a number of computer industry heavies, including IBM, Apple, Microsoft and Hewlett-Packard. There is a very real fear amongst those charged with deciding which computer operating system the company should commit itself to for the next five or more years, that certain of the alternatives offered today may become unsupported deadends if the parent company loses in the litigation stakes.

Everyone accepts sophisticated applications need a more sophisticated operating system than DOS, but few are convinced that that system is OS/2 – which only offers multitasking and not multiusing in its current form, in any event. But – Unix is already mature, established and stable and its image as a 'risky' recommendation is rapidly changing.

Unix offers still another practical advan-

SELTEC

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In short, there's something for the whole family to enjoy!

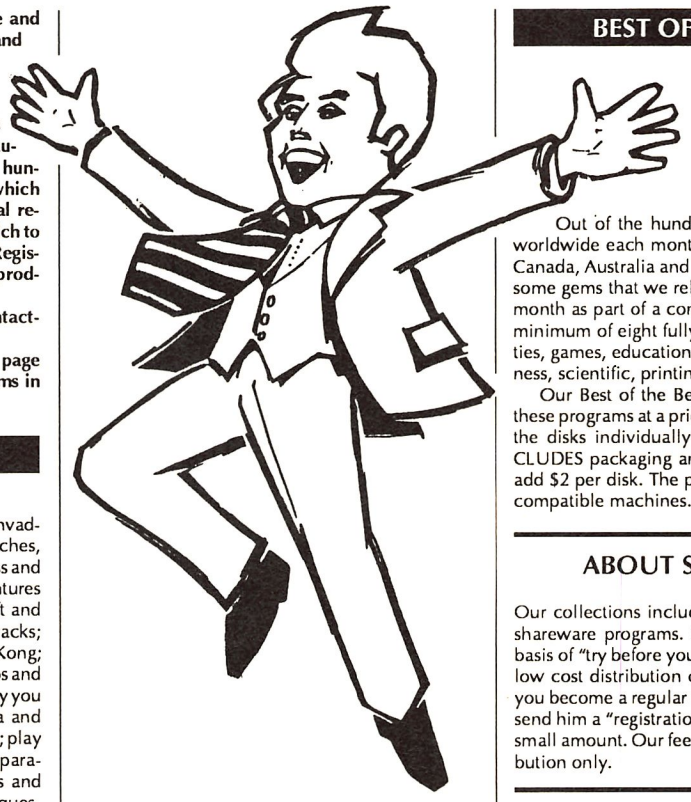
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tage to companies whose computer systems have grown from a single PC seven years ago to a collection of varied machines scattered across the country – probably for the first time, all of them can run the same software and freely exchange data. Not only that, but the philosophy of 'distributed processing' is gaining ground and giving a legitimacy to that collection of machines – PC users are no longer considered poor cousins of mini and mainframe users.

Critix

IN ADDITION to the criticism of Unix that it was unfriendly and unsuited for general use, opponents to its adoption have noted the lack of applications (particularly data base systems), its poor security features, its poor communications, its poor file handling system and the limited number of users that can work under a single system.

Certainly there were relatively few full-fledged applications for Unix that were useful to PC users up until recently, but now that there is a million-plus user base and it's expected to grow at a rate of 20 per cent or so for the next few years, there's not much of a problem with applications. Recent releases in Australia include Samna Plus, Dataflex, Q-Office Plus (a multitasking office automation package) and AutoCad 10. Unix versions of Microsoft Word, WordPerfect, FoxBase and the Microsoft languages have been available for some time, as have enough other applications that lack of software is hardly a valid reason for criticising Unix. If there's not one there to suit, the latest release of Unix, System V/386 Release 3.2, now has the ability to run 'every DOS application currently on the market' – see the accompanying box item.

The criticism that Unix is 'not optimised for transaction processing' is a technical one that holds for *very* large systems, but most users would probably find nothing to criticise – in addition to FoxBase, a dBase workalike, there are other excellent database systems available, including Oracle and SCO Integra, an SQL relational database available as part of the Office Portfolio suite.

For some years data processing professionals have perpetrated the myth of the poor security features found in Unix – the basis for this attitude probably stems from their university days: not only are security systems (usually) somewhat slack in the halls of academia, but it's unlikely that any security system could stand up to the combined efforts of tens of thousand curious, fledgling hackers, especially if they'd had intimate instruction in the workings of the operating system. Of course this knowledge was carried with them as graduates and the industry abounds with tales of 'unauthorised intrusions' into Unix systems.

Unix System V

A MARKET LEADER leader in Unix products for desktop microcomputers, the Santa Cruz Operation (SCO), in conjunction with Microsoft, worked to develop the Xenix operating system as a commercially enhanced version of Unix. This occurred in 1983, and was followed by further development of a number of applications, and the addition in 1985 of SCO Xenix for 80286-based computers. Their latest product, SCO Unix System V/386 Release 3.2 is a merger of Xenix System V and Unix System V/386.

As well as Xenix compatibility, Release 3.2 enhancements include support for alternative date and time formats, alternative character sets (a Japanese version has been released already), the ability to show a user's last log-in time, recording of unsuccessful log-ins and further optimisation for '386 hardware. Unix System V Release 4 is due for release from the AT&T camp later this year or early next year, and OSF/1 sometime after that. Release 4 will merge two important Unix versions: the Berkeley Unix BSD 4.3 environment with its extensive networking and user interface development which has been carried on by Sun, and the mainstream Unix System V.3 which has benefited from extensive user input.

AT&T is planning to release source (binary) code to the Unix International (UI) group it leads, locking out the the 90 participating members of OSF (there are over 70 'supporters' as well as the principles). UI has become very broadly based, including such diverse companies as Xerox, Sony, Dupont's Fibre Division, NEC, Ricoh, Toshiba, Locus and Relational Technology.

While the Unix contenders are all lining up in one of the two camps, users don't see two competing systems as a real problem since both will comply to the IEEE Posix specification for application program interfaces. As one widely quoted user pointed out: 'As long as the product has X Window and TCP/IP, we just don't care.'

As result, AT&T announced in February this year that Release 4.1 of System V will include 'improvements in the area of access methodology, the maintenance of data integrity, the denial of service and intruder containment' (a release date for 4.1 wasn't given, however). Users of 3.2 already have the option of conforming to the US Department of Defence's C2 security classification as outlined in the *Trusted Facilities Guide* which enables system managers to maintain a high level of security and implement an audit trail of system use.

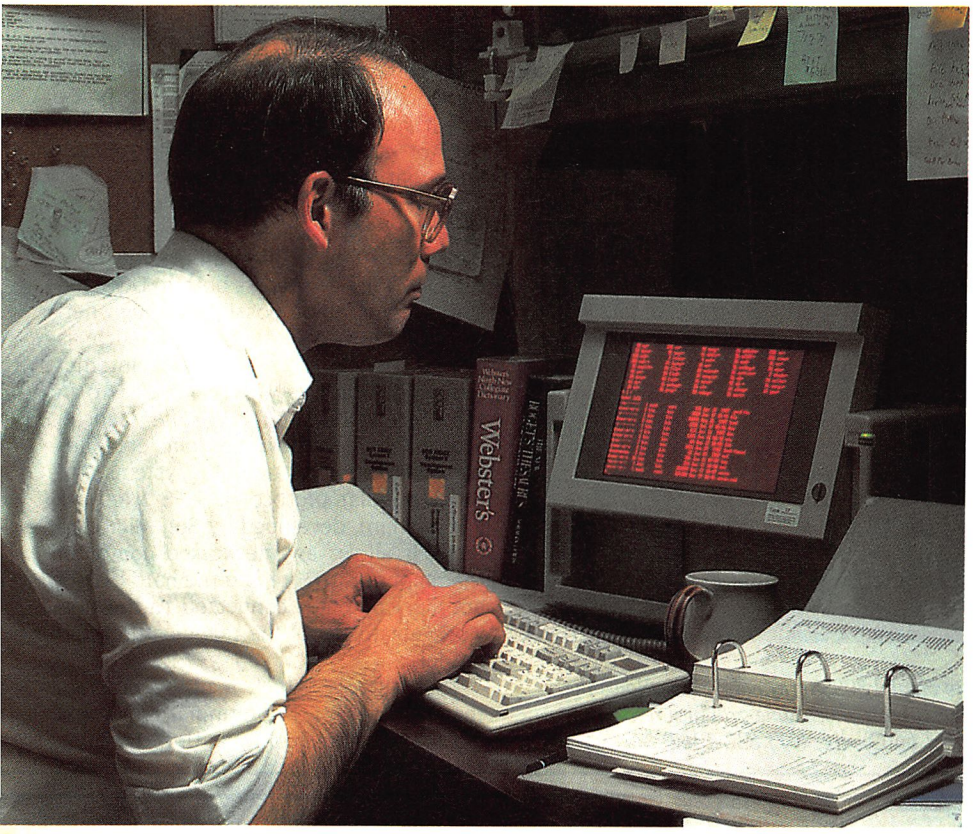
Unix has a very simple approach to files: it treats *everything* as a file – devices, peripherals, 'real' files, whatever. This attribute laid the groundwork for many of the best features of the language, particularly its portability and open-ness. It also lead to criticism about file access methods, the lack of support for large files and slow file access. For a start, most users are installing relational database and other packages with their own approach to file access, so that argument becomes irrelevant. Unix can currently support files up to 4 *giga*bytes in size – if your files need to be bigger than that, the criticism is valid. From the command line, file access can be slow in Unix, but again, that becomes irrelevant as applications are installed as a front-end.

Finally, any limitations to the number of concurrent users on a Unix system is determined by the hardware of the system; there is no 'builtin' limit to the number that Unix can handle at once (see the box item, 'What you need').

X Windows

UNIX WAS developed without a specific user interface in mind, which certainly added to the 'it's unfriendly' argument. However, in 1984, the Massachusetts Institute of Technology embarked on Project Athena with the goal of determining a method of supporting a large network of workstations supplied by a number of different vendors. The outcome was an interface that set the mechanics of operating applications under Unix, covering such things as multiple applications running concurrently on the same screen, and multiple overlapping windows for each application.

The interface also provided for high quality text and graphics while operating on any bit-mapped screen. It had to be able to operate both on a single-user and networked systems without the applica-



Unix offers a practical advantage to companies whose computer systems have grown from a single PC seven years ago to a collection of varied machines scattered across the country – probably for the first time, all of them can run the same software and freely exchange data.

tion being aware of the difference, and it had to operate on a wide range of hardware types. The result was the beginning of the X Window standard.

The interface specification was interesting in that it allowed for the mechanics of a graphic interface, but unlike Presentation Manager and the Macintosh interface, no restrictions were imposed on the preferential appearance, use and style of the interface. Factors such as colours or shades of grey, and the use of menus or icons were left open. After its first release in July 1986, many developers (including Apollo, Sun and DEC) worked on enhancements which were in turn handed back to MIT.

A decision was made to control development of X Window by deciding on a definitive version which included the developer's enhancements (X11), and to freeze the release date until 1991. This has allowed software developers to utilize X Windows to everyone's advantage, without having to continually re-adjust code whenever an enhancement to the 'standard' was announced. This has led to an almost universal acceptance by Unix suppliers of an X Window-based environment.

Applications under X Window make use of a library of procedure calls, XLIB, that can be accessed from C, Pascal, Modula-2, ADA or Fortran. Alternatively, applications programmers and users can use a higher level toolkit for writing user interface elements such as menu structure, scroll bars and command buttons (called 'gadgets' in Amiga and Mac interfaces). There are several toolkits available and already in use that provide different programming and user interfaces, including AT&T's Open and DEC Windows.

The graphic interface battle has been raging in parallel with the Unix battle, with various companies making alliances and claims. Sun, Apollo, DEC, AT&T, IBM and Hewlett-Packard are all working on various 'looks and feels' that will be condensed to two or three interfaces to match the shrinking number of Unix versions. At present, the major contenders for graphic interfaces are AT&T's Open Look, a Presentation Manager look-alike from Hewlett-Packard and Microsoft (PM/X), and from the OSF group, another Presentation Manager look-alike, probably based on OSF/Motif. Products such as Office Portfolio and Open Desktop, both available soon from SCO, have been introduced to meet a variety of standards and different interface requirements in the microcomputer arena.

SunRiver Fibre Optic System

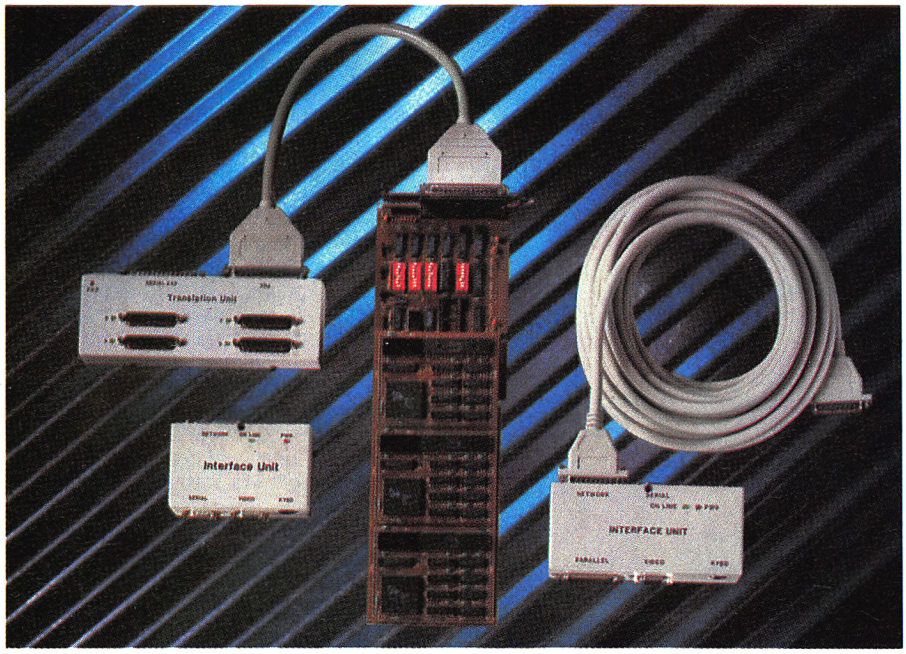
ONE SIGNIFICANT disadvantage to using inexpensive terminals or 'diskless PCs' as remote stations on a shared 80386-based multiuser system has been their inability to run bit-mapped graphics. The US-developed SunRiver System overcomes this with a fibre optic interface between the 80386 server (running Unix or Xenix) and remote terminals, which can be SunRiver Stations or PCs, XTs or ATs fitted with a SunRiver PC LightCard.

The PC LightCard converts existing PCs, XTs or ATs into multifunction workstations by providing access to an 80386 host over a fibre optic link. Bit-mapped graphics (DOS CGA, EGA and VGA or Unix/Xenix graphics) can be transmitted at 32 Megabit per second.

Alternatively, SunRiver Fibre Optic Stations can be used instead of the PCs. These allow DOS EGA/VGA bit mapped graphics, and Xenix/Unix graphics to be run in a multiuser environment. The Stations also have two serial ports, one parallel port, a 101-key keyboard, speaker, and will support a standard serial mouse.

The system is completed with the use of a SunRiver fibre optic Host Adapter, which is a four-port, full duplex fibre optic communications adapter that slots into a 16-bit AT slot. Fibre cables are attached between the Host Adapter and the user's Fibre Optic Stations (or PCs with LightCards).

The SunRiver System allows operating system support for Unix, Xenix and DOS with relevant software installed. For example, SCO Xenix System V with Interactive's 386/ix and VP/ix. Retail prices (untaxed) are: Host Adapter $1110; PC LightCard $1265; and Fibre Optic Station $2512 (VGA Lightbase). SunRiver products are available from Blue Sky Industries (02) 419 5799.



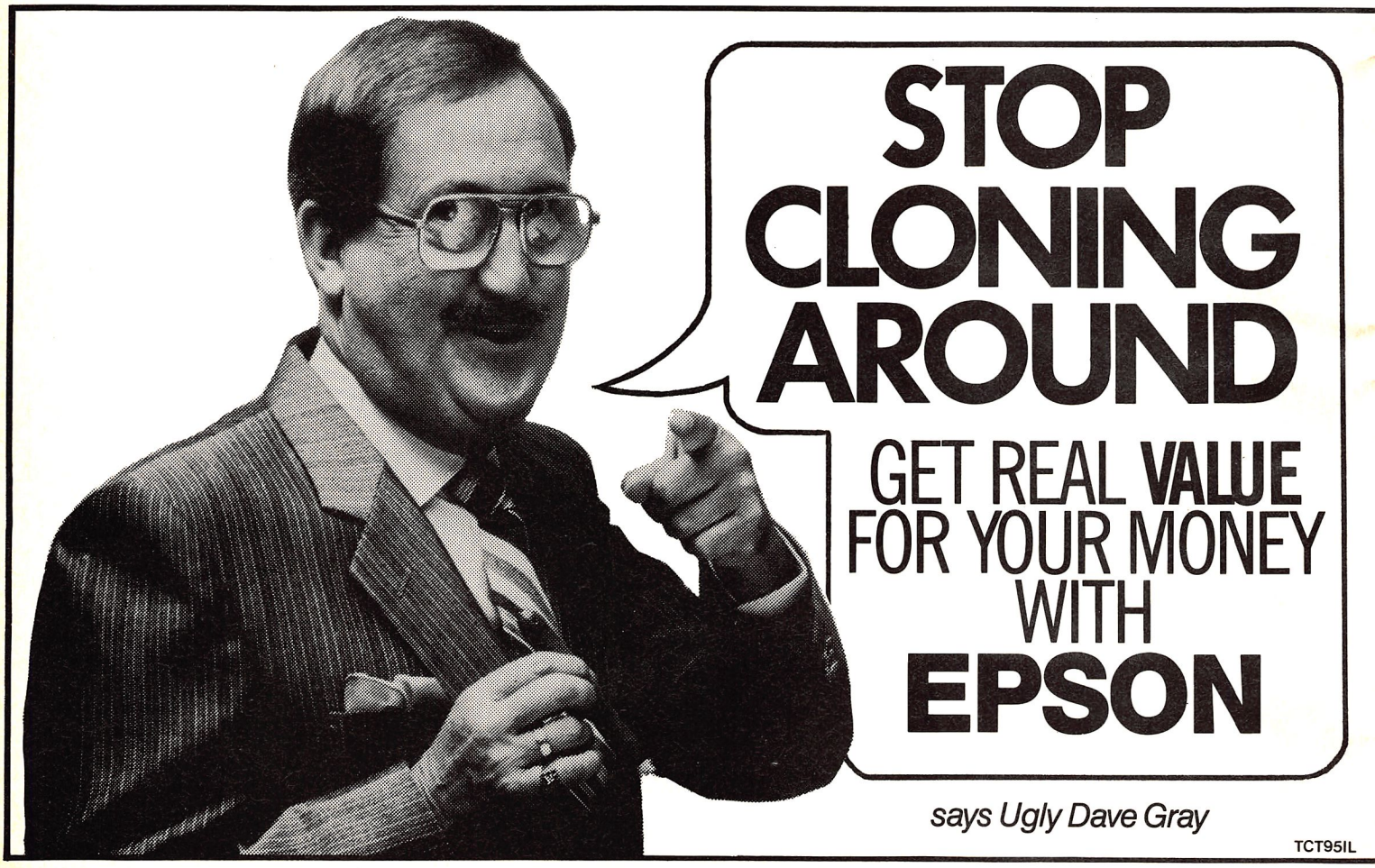
The UnTerminal uses the 80386's ability to create virtual 8086 terminals – this allows the use of low-cost monitors and keyboards to give Hercules monochrome graphics resolution on the remote terminals. The system is distributed by Qunix, (07) 832 1367.

Connixions

UNIX HAS always had a reputation for poor communications support. Talking Unix to Unix has never been a problem, it's when users tried to interface with DOS or other operating system applications that the trouble started.

Now, it's possible to connect PCs in an Ethernet LAN (Local Area Network) with a file server running Unix, and each user in the LAN will have access both to DOS and Unix. This is made possible through networking protocols or standards such as TCP/IP (Transfer Control Protocol/Internet Protocol), which is widely adhered to in the Unix world, and FTP (File Transfer Protocol), which allows the transfer of files between disparate computer systems. Another popular protocol is NFS (Network File System), developed by Sun Microsystems. It allows any networked computer that supports NFS to use the hard disk of another computer connected to the network, regardless of the manufacturer and model.

Then there's Telnet, a utility program that provides VT 100 terminal emulation on a PC connected to a Unix host via



Ethernet. It is a TSR (Terminate and Stay Resident) program, so users can be running a DOS program in the foreground, and be logged on to a Unix system in the background, switching between the two at will.

Another alternative, and one that should prove to be a popular choice, is to use the power of a '386 computer to run Unix and DOS simultaneously. The 80386 chip is able to operate in virtual 8086 mode, where the CPU emulates an 8086 CPU. With products such as Locus Merge 386 and Interactive Systems VP/ix, it is possible to have a single 80386 running Unix and emulating several 8086 CPUs, although performance is limited to that of an 8086 machine.

Now that almost every objection to Unix has been overcome under the onslaught of development over the past several, apart from factional fighting, it's hard to imagine why it is not going to be the universal operating system users have dreamed of – but now it's pretty well in the hands of the marketing departments (and lawyers) to determine how far we'll go in the grep of Unix. □



NEC Information systems offer a range of minicomputers running their own version of of System V compatible Unix, ASTR-IX. The System XL/300 (pictured) is based on Motorola's 68030 chip and a 68882 maths coprocessor; it can be configured with 2 to 66Mb of RAM, 580 to 5230Mb of disk storage and 8 to 16Kb of cache memory. The system can handle up to several hundred concurrent users – base price for the system is about $60,000.

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UNIX -why the fuss?

You'd be forgiven for feeling a bit left out of the recent stirring over Unix if you've been bought up on PCs or Macintoshes. Unix seems to be some strange computer-Esperanto spoken only in ivory tower institutions. But, as Stewart Fist found, it's beginning to invade our cosy little DOS and Mac worlds.

INTERNATIONAL DATA Corporation (IDC) say that by 1993, the Unix system and operating environment alone (not counting applications), will hold 19 per cent (about $US35 billion) of the annual international software market. Frost and Sullivan forecast that Unix systems for 32-bit supermicros alone, will represent $US4.7 billion by 1992 (with Unix applications, the market will be $US22.6 billion). While analyst Mark Stahlman of Stanford Bernstein & Co predicts a total of $US1 trillion in Unix sales between now and the year 2000.

It is pretty obvious that something is stirring in the Unix camp. Perhaps we ought to find out why! Like so many of our technological toys in the global-village play school, Unix originated at Bell Laboratories, way back in 1969. It first saw light as an operating system for minicomputers, but since then it has been born-again a number of times and married to both micros and mainframes. Now at the ripe old age of 20, with a good injection of silicone and a face-lift, it appears to be making its debut as the Miss Universe of the computer world.

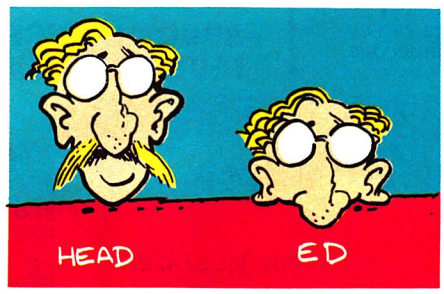
Unix was almost an accident. Ken Thompson, a young scientist at Bell in 1969, was sniffing around at Bell and found a DEC PDP-7 minicomputer lying about not being used. He decided to try out an idea for a new file system, but the machine didn't have an operating system suitable for the development project – so he wrote his own, aiming for 'a pleasant environment in which to write and use programs.' Remember, this was back in the days when a lot of computers were still controlled through card-punch machines.

Dennis Ritchie, also of Bell Labs and creator of the C language, found Unix so fascinating that he joined forces with Thompson to refine it in the early 1970s, and finally Bell's parent company AT&T (Western Electric) took it up and created a licencing system. Unix was mainly directed at universities, which means that there have been a lot of clever programmers dabbling in Unix for many years.

Thompson and Ritchie believe that, 'paradoxically, the success of Unix is largely due to the fact that it was not designed to meet any predefined objectives. Since we were programmers, we naturally created a system where it was easy to design, write and debug programs.

Today you can't actually apply the term 'friendly' to any 20 year old mini/mainframe operating system, but Unix has been rewritten and modified and upgraded and rewritten again, and the basic design has proved to be much more resilient than anyone could ever have imagined. There are a couple of reasons for this.

Initially Unix was written in assembly language for the PDP-7, but the two developers soon became unhappy with this approach; it was apparent to them that Unix would also work on computers with different instruction sets if they used an intermediate-level language rather than continue with assembler. C was the obvious choice because it is a 'half-way' language which has fast program execution speeds yet it only hogs a minimum of memory.



These C versions of Unix are portable because the operating system is no longer directly linked to the instruction set of a central processor, and since the program was primarily written for minis and mainframes, it was multiuser and multitasking. Microcomputers are just reaching this stage now with the '386 and the 68030 chips after years of development as standalone units on individual desks – which is why Unix has suddenly surfaced in business computing environments, and is now being seen as a serious competitor to OS/2.

Programmers like Unix, and there are plenty of programmers around with university training (and, therefore, experience) in the system. Despite the fact that Unix uses a rather cryptic set of commands, it is not a very large, complex program, so experienced computer programmers can expect to learn and understand the system within a couple of weeks. Beginners will find that they have almost-immediate functionality (despite the terse command language) and that there are extensive arrays of software tools to help them as they progress. Unix has been very extensively developed; you will find everything you need in this environment.

Unix is also a true general-purpose operating system. It is easy to completely change the appearance of Unix for specific applications – and one of the traps is that everyone likes to fiddle and be creative with the system. But fortunately the logic remains pretty much the same even though there are many versions of Unix, each with its own idiosyncracies.

At the centre of Unix is the kernel which schedules tasks and manages the data storage. Surrounding this, is the shell which acts as the interpreter of the commands from the user. It calls programs from memory and executes them – either one at a time, or in a sequence known as a 'pipe'.

Most of the functionality of the system however, depends on the utility programs which perform a variety of routine and special functions. When you purchase a Unix licence, you also get a couple of hundred programs which provide the main functionality of the system. For instance, the mail program (Unix usually uses lower-case for all commands and program names) provides electronic mail throughout the system, while the who program provides information about any other users on the system at the time. There's a spell program that uses a file called

/usr/dict/words; and ed program for text editing; man which provides an on-line manual; lpr which is the line-printer spooler, and hundreds of others.

Kernel commands are kept to a minimum – Ctrl-S, for instance, halts the display, Ctrl-Q restarts it, and Ctrl-D terminates a keyboard message. The shell directs commands either to the kernel, or acts itself to find and bring into memory a program and execute it. Unix programs are usually located in either the /bin or the /usr/bin directories.

Note the use of cryptic directory pathnames and the now-standard backslash delimiter. With Unix systems you will find a relatively standard breakdown from the root directory into the /dev/ branch which holds devices, the /bin/ for utility programs, /ect/ for essential data (passwords and the like) and dangerous maintenance utilities, /tmp/ for temporary files, and /usr/ for general purpose user files. Under the /usr/ first-level subdirectory, you might well find another level of bin/, temp/ and lib/ subdirectories specific to the user.

You spend most of your time interacting with the Unix shell program when you use this operating system; this is where the power of the system comes from. The shell handles I/O redirection (see below), and is actually a programming language in itself. Quite complex data management functions, testing, and file manipulation can be made simply with shell commands. You don't need to 'write programs' in the traditional way.

'Shellscript' programming includes loops, if-then-else and case structures. The shell also allows you to customise the Unix response to your commands. You can change the prompt character, direct the system to search in particular places for commands, change the names of Unix commands, and preset a list of commands to run each time you log on to the system.

The shell (system) prompt is either the $ sign, or the %, depending on the version being used, and the program name is entered as a command immediately after the prompt. For instance the command 'find', loads and runs the find program (which searches directories), and if a parameter is present (-name, for example), this option will restrict the action of the program to that established parameter.

These command sequences are called shellscripts, and they are a series of filenames, commands and options which select and link together system commands to create specific programs. A simple example would be:

```
$ find-name "*.c" -print ¦ tar c
```

which is used to back-up disks. The find program goes through the directory structure looking for all files that end in .c (the * is a wildcard) and emits a list of these filenames. This list is then automatically (and simultaneously) handed on to the tar (tape archiver) program, with the final c instruction creating a new back-up tape.

This is not near-English programming; there's nothing simple about this example or about most Unix shellscripts unless you've been initiated into the mysteries of the language. And the only way to learn Unix is to sit down at a console and use it.

However, there a numerous Unix features that make the time spent worthwhile. So let's have a look at some of the similarities and differences between Unix and your present operating system:

Unix Commands

UNIX HAS A reputation for being awkward and unfriendly. This most likely stems from the fact that it has almost three times as many commands as DOS. But, as the examples here show, most of them are quite simple; used with the powerful range of qualifiers the language employs, they are also very effective –

cat [qualifiers] – joins (concatenates) files and lists the result; the qualifier *-n* indicates the starting line counting from the top of the file; *-s* ignores consecutive blank lines.

cd [directory] – as in most operating systems, this changes the current directory – note the entire path must be shown; for example –

cd /u/user1/doc

chmod [mode] – changes access permission to files; note that the qualifiers to *chmod* don't use the leading hyphen; the qualifier *u* refers to the current users files, *g* to a defined group's files, *o* to others' files and to all files; these are followed by + to add permission, - to subtract it, and = to replace permission; the standard 'permissions' are *r* to make the file readable, *w* to make it write-able, *x* to make it executable, *s* sets the owner or group identity and *t* allows text to be saved (see the example below in the discussion on shell commands).

comm [qualifiers] – compares two files for common lines; the *-1* qualifier suppresses listing the common lines in the first file; -2 suppresses lines in the second file; -3 suppresses common lines in both files.

diff [qualifiers] – lists the differences in two files of directories; the qualifier *-b* ignores trailing blanks in lines; *-e* lists changes necessary to make files identical using *ed*, Unix' line editor.

grep [qualifiers] – searches a file for a pattern; the qualifier *-c* prints the number of matches; *-n* lists the line numbers of matches.

ls [qualifiers] – lists files in the current directory in alphabetical order; the qualifier *-a* lists all files; *-c* lists files in order of creation; *-g* gives group identity; *-l* lists in 'long' format, that is all permissions, number of 512K blocks used, creation date and time last modified are shown; *-s* in block size; *-t* sorts the listing by time last modified; *-u* sorts on last access time.

sort [qualifiers] – sorts or merges files; the qualifier *-b* ignores blanks; *-d* sorts in dictionary order; *-f* changes upper case to lower case; - ignores characters outside the printable ASCII set; *-n* sorts numbers by order; *-o* directs output of the sort to a file; *r* sorts in reverse order.

In addition to executing commands from the command line, the Unix shell can read and execute commands held in a text file (like DOS batch files). Known as shell procedures (or scripts), the files can be created and edited using the built-in line editor, *ed*. This simple example of a shell procedure lists files in the current user's home directory and sorts them by the time they were last modified (note that the Unix command line prompt can be either $ or > depending on the version used) –

```
$ ed
a
ls -t
.
w lsmod
q
$ chmod u+x lsmod
```

– *ed* invokes the editor; *a* tells the editor to append a line of text; *ls -t* lists and sorts the files as required; the . tells the editor there are no more lines to be inserted; *w* writes the lines to the file *lsmod*; and *q* quits the editor. The *chmod* command is then used to set permission for execution to the current user only.

Unified 'file' handling. Operating systems don't always impose a structure on their files, but most do and Unix is no exception. It uses the relatively standard 'hierarchical' (tree-like) file system. A Unix file can be accessed by using its several different names through pathways, all branching down from a main 'root' directory. The backslash (/) symbol is used as a sub-directory identifier/separator.

In Unix, a directory is itself a standard file (Unix doesn't differentiate between types of files) which means that it can be read by any application just like text. A directory file just consists of the names of the files and information that enables the computer to find them within the structure. Thus far, Unix is very like most other popular operating systems – but it takes this unified file concept further.

In fact, to a Unix system, all devices appear if they were ordinary files. Just as the user's own text files would usually be found in a /usr directory, devices will be found as entries in the /dev (for 'devices') directory. This might seem strange until you think about it, but from the computer's viewpoint, all peripherals exist either to provide data to the CPU, or as repositories/translators to which data is sent. Why make a distinction between disk peripherals and all other sources/destinations?

Because of this unified way of handling all input/outputs, a Unix program which was written to output its data to a disk file could easily be rewritten to work with a printer instead. But Unix takes this unification idea a step further again; a process called 'redirection' makes even this minimal rewriting unnecessary.

Redirection means that the same program can be made to serve many purposes simply by issuing a '>' command through a shellscript. A program that usually 'prints' to a screen can be redirected to a dot-matrix printer, hard disk file, or another device. Input can be taken alternately from a file, modem, or any character-reading device instead of the keyboard by very simple instructions through the shellscript.

For instance the command:

```
$ who
```

would provide you with a list of the other users currently on the system by running the who program utility, while:

```
$ who > user.lst
```

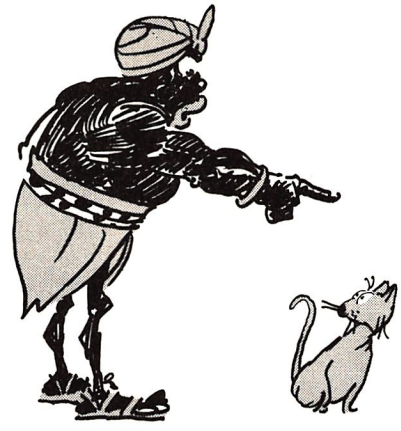
would direct the output of the who utility to a file called user.lst (and create it, if it didn't already exist), while:

```
$ who >> user.lst
```

would append the current users to a previous listing, and

```
$ mail test < user.lst
```

would make the mail program take its input from the user.lst file instead of the standard input file and hence the keyboard. Redirecting input breaks the normal connection with the keyboard; redirecting output breaks the normal connection with the screen. The philosophy behind this approach is to provide a general set of software tools which can replace a whole range of specific tools. A single method can be made to serve a variety of purposes.



UNIX GIVING CAT COMMAND...

So, the same system calls are made to read and write to disks, devices, or to interprocess data buffers, and the same naming, aliasing and access-security techniques apply to data files, directories and devices. Unix even uses the same mechanism to trap software interrupts, abort requests and for processor traps.

Simplification. One of the major design goals of Unix was to keep the system simple. The functionality of the operating system is kept to a minimum, and sophistication is provided by a very extensive range of user programs. As a corollary to this form of simplicity, therefore, we also have modularity: most of the functions are modular, which makes for easy debugging. As a result, features can constantly be upgraded, and it is unlikely that changes in one part of the system will effect others.

This approach has made Unix dynamic – which is both source of its strengths and its weaknesses. It means that the operating system is constantly being modified by every casual fiddler – which makes it hard to preserve standards.

In order to work at the simplest possible file-structure level, Unix permits any device (video terminal, laser or dot matrix printer, and even main memory) to be accessed a character at a time, both when reading and when writing. From the point-of-view of the operating system, all Unix files are just a single sequence of bytes. The system doesn't assume that there will be any structure. This applies even with disk drives; if any device does require data in large blocks instead of a stream of individual bytes, Unix will take care of these details internally and unobtrusively.

When you type on the keyboard, Unix sees your keyboard's output as an incoming 'input' file, providing a stream of data bytes. It automatically sets-up a standard input file buffer from which the program will read the data. The default for most programs is to read from the standard input file unless it is instructed to read from disk or some other source. So, if, for instance, I type:

```
$ cat (CR)
This is another line (CR)
and another (CR)
(Cntl-D)
```

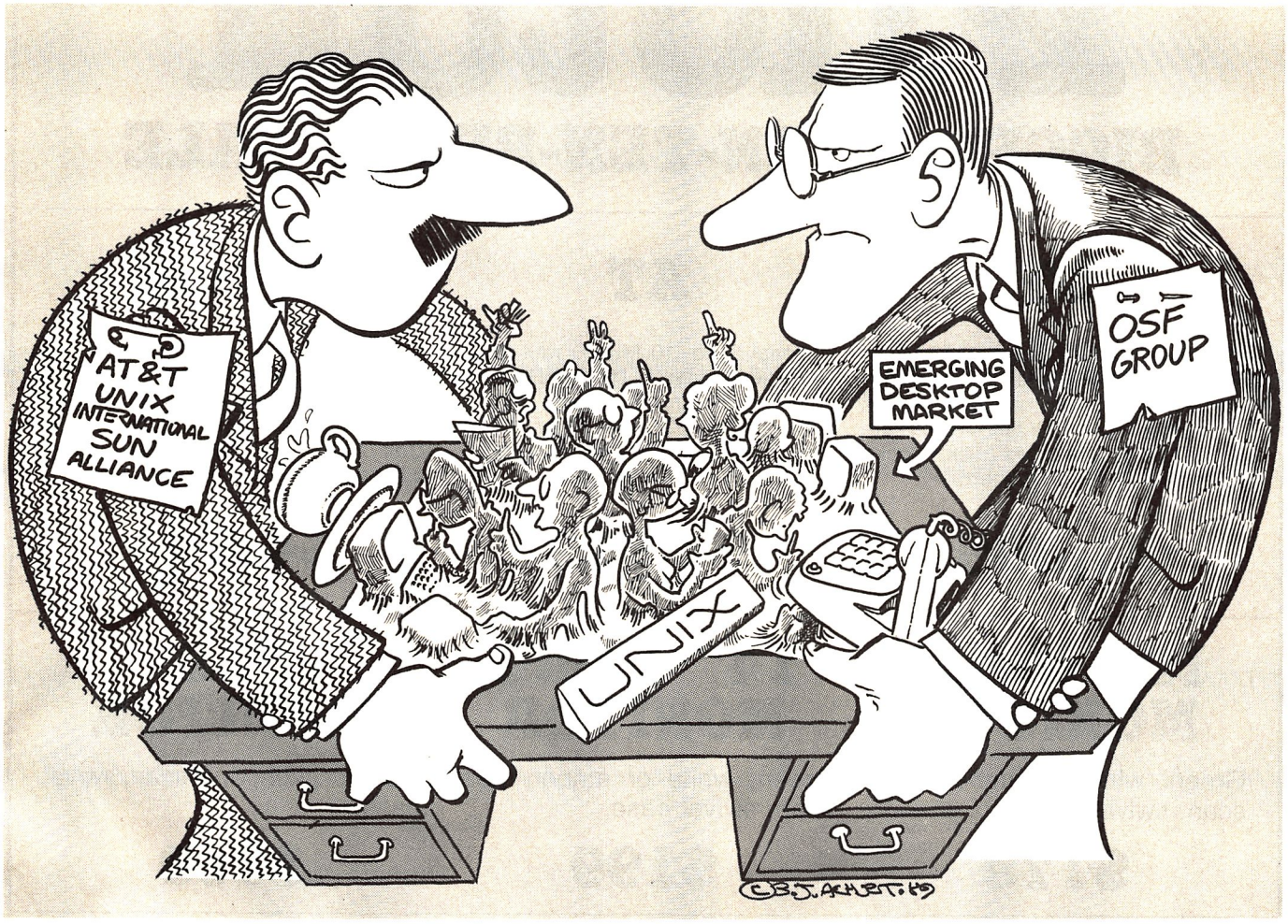
The computer will reply by displaying, once again, the contents of the standard input file, which in this case will hold the characters, 'This is another line and another'.

The 'cat' command (from 'concatenate' – to join together) tells Unix to use the file-management program called cat which links text lines together and then displays/prints them, by default, on the screen. Cat is widely used as a simple way to throw words up on a screen even when concatenation isn't needed. The Ctrl-D command simply exits cat and causes the shell to issue another $ prompt.

If I had made this command line:

```
$ cat temp trial > textfile (CR)
```

the output of existing files 'temp' and 'trial' would have been concatenated and directed to another file named 'textfile'



which the system would either have created or overwritten. Unix sends its output first to a one of a pair of output files – text goes to the standard output file (which is buffered before it feeds the screen), and error messages go to a standard error file (which feeds the screen direct).

Piping. Unix uses numerous programs known as 'filters' which perform one function only by operating on an input and transforming it into some different output. The output of one program may be directed straight into the input of another – the analogy used is that of a series of interconnected 'pipes'. By piping these programs together, the filters become modular chain structures which are capable of complicated functions without the need of more complex programming.

The trick here, is to accomplish large tasks by combining several small tasks whenever possible. This keeps large applications simple, and allows you to learn about each filter program separately – and you get the benefit of understanding modular solutions to complex programs. An example: I can store the shellscript pipe:

```
$ prep testfile | sort | uniq |
      comm wdlist
```

as a file called, say, 'spelchex'. Now, by issuing the single word command 'spelchex' the file named testfile will be broken into individual words (by the program prep), which will then be sorted into alphabetical order (by sort), and compared to remove duplications (by uniq), then compared with the existing dictionary file (wdlist) by the program comm, to throw out anything not in the dictionary. If I replace the filename testfile with the variable $*, I can then designate any file I choose.

To take another simple example: we can see the value of piping when running Unix to create back-ups where the main storage disks are very large capacity. It might take hours to save all files on to tapes or floppy disks in one hit, but generally the Unix system administrator will only update those files changed on that particular day - rather than updating the lot.

Normally a back-up program would search through the disk looking for files that have been changed, and when it had compiled a list, it would then set about creating the back-ups. But Unix's pipe commands take advantage of the multitasking nature of the operating system by running both simultaneously in the background mode. The vertical bar symbol is the chaining command, as we saw in our earlier example, but here it allows simultaneous operations:

```
$ find -name "*.c" -print | tar c
```

Here the list of filenames has been

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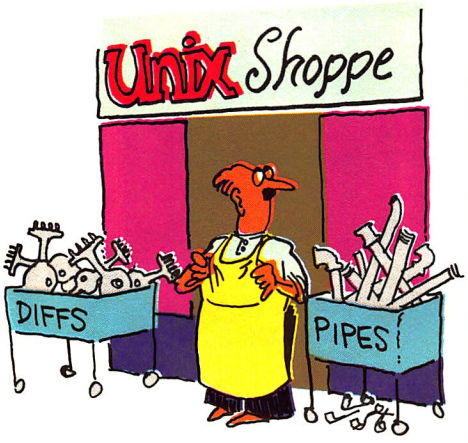
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handed on from the find program to the tar (tape archive) program, and any number of command sequences can be chained together in this manner and they will run simultaneously if the programs allow. The leading dash in front of an argument (text or numbers) indicates that this is an option which modifies the command in some way.



Multiuser/multitasking. Unix makes multitasking easy; all you have to do is type a tilde or an ampersand at the end of any command line, and you'll immediately get the shell prompt. You can then enter your next command while the other project churns away in background mode.

On all but the smallest Unix minis or microcomputers, several people can use the computer at once. Unix was designed specifically for multiuser operations, so if everyone wants, say, to print at the same time, the system organises itself so that data doesn't get mixed up. It does this by automatically writing the data to disk files and then prints from these in sequence.

Modems are also supported so that the system can be used remotely: Unix matches the incoming baud rate. You can also send messages to other users on-line or as electronic mail – it's all built in to the system. The uucp program allows you to send mail to users of other Unix systems.

Multiuser systems always need a lot of security and control, and Unix provides various levels of protection through a number of different mechanisms. There are the normal login password controls, but at a more personal level, any user can set the protection on their own files and directories, so that others can't read, write, or execute them. The highest level of protection is provided by encryption of data, which is possible on Unix through a special encoding program. □

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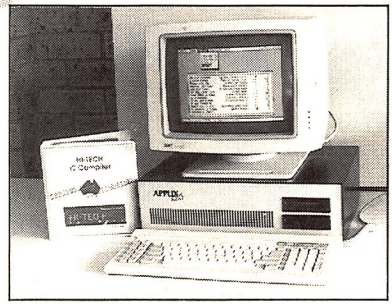
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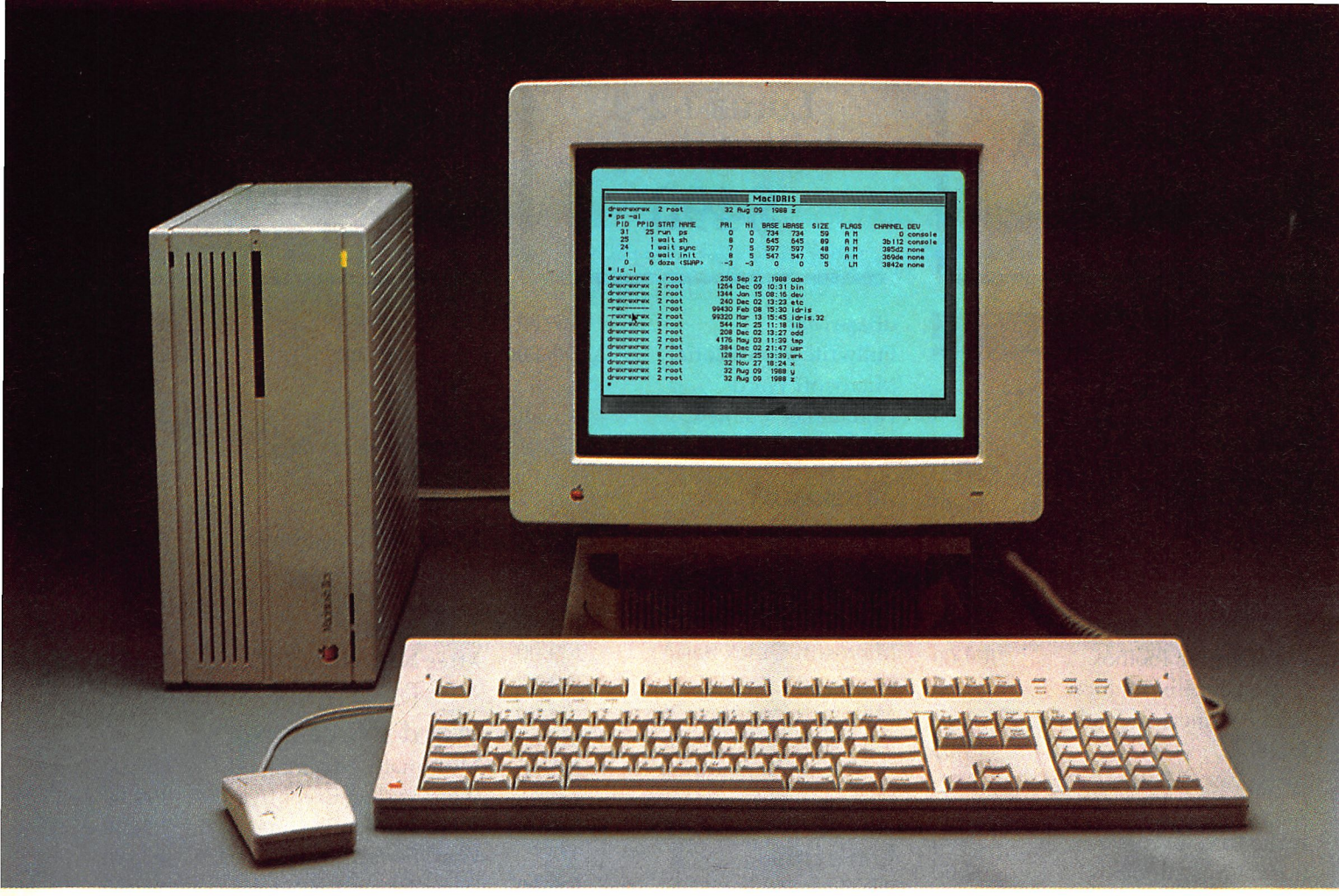
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Unix and the Mac

The first question anyone should ask about the new phenomenon of Unix on the Mac, is why? More than any other computer, the Macintosh is synonymous with its operating system – the aim of which is to be largely invisible. And, since it is probably the best operating system in the world for a personal computer, why would anyone want to change it? As Stewart Fist relates, there are a number of reasons. . .

APPLE FOUND quite early in development of the Mac that Unix was necessary if they were ever going to make headway in the university market, since Unix and universities go together like pies and tomato sauce. So, for starters, Unix on a Mac makes sense as an undergraduate training tool; a way to get experience on a standalone before you face your Maker on a real mainframe.

If that is all there is to Mac Unix, you'd do better with a Unix tutorial on HyperCard – and for that you wouldn't need a two-megabyte Mac II, with an 80Mb hard disk, PMMU chip and the new ROM – at a conservative cost of nearly $20,000 Australian.

A second, and even more valid reason, is to use the Macintosh as a Unix development tool. Then there's circumstances where you need true multitasking – and despite Apple's fairy-floss promotion, Multifinder isn't that yet. If you want true multitasking, you need Unix. But the most important reason for the use of Macintosh Unix, is Unix itself – because it is almost at the opposite end of the operating system spectrum to the Mac OS. They are opposites in almost every way.

While the Mac OS is tightly defined, very complex, and very rigid, Unix is a minimal but very flexible and powerful operating system – or rather, an environment. The term 'environment' fits here much better than it normally does when talking about operating systems because there is much more to Unix than multitasking and multiuser operations. The key to Unix is modularity – once you've got Unix on your computer, you (a user, not a programmer) can create an amazing range of applications yourself.

One on-going crusade in my 'Your Mac' and 'Your Apple' columns has been a cry for the modular design of applications

both for the Mac and the Apple II line. Computer software must become truly modular; you should be able to buy a basic 'shell' into which you can plug the application modules you want at the levels of complexity you need. For instance, the original AppleWorks for the Apple II (which is one of the best programs ever designed), is an integrated program with word processor, database manager, and a spreadsheet. But it doesn't have such essentials as communications, a dictionary or thesaurus – and the first version didn't even have mail merge (mail merge has now been built in to AppleWorks 2.0, and there are a number of third-party co-resident program patches that supply macros, communications, and spelling specifically for AppleWorks – when you add these they modify the code and structure of the main program).

Well it seems to me that if third-party developers can patch features into an existing program, then first-party programmers could make provision for these, at the original design level – to the point where almost anything you want can be hooked into the basic shell.

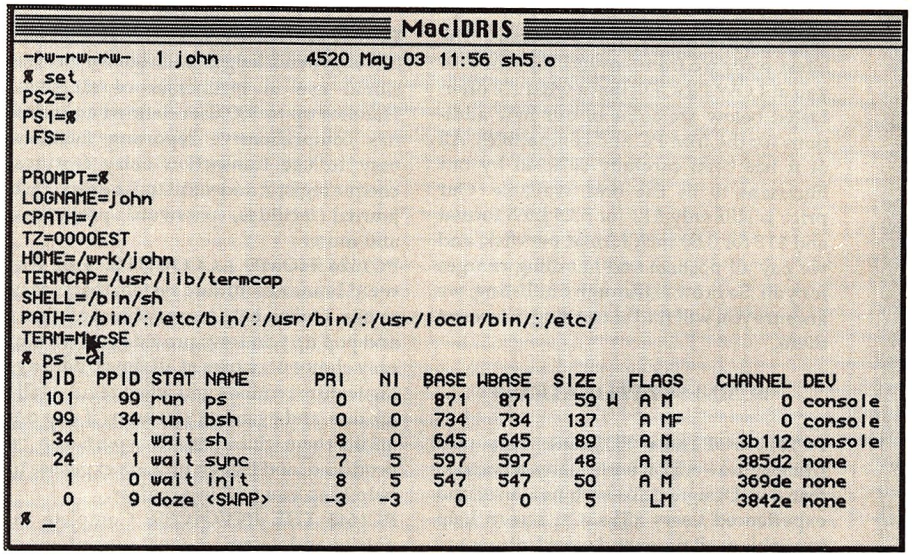
If that were so, I would choose to customise my AppleWorks shell to hold the word processor, the database manager, communications and perhaps the spell-checker – you might configure yours quite differently. Whenever I had a job that required mail merge, I would just fire up a specially customised version with that facility.

Suppose your Mac applications were broken down into component parts. Suppose MacWrite was nothing more than a slightly sophisticated text editor with no formatting. When you wanted to format something, you would pass it through a format program. When you wanted to search the text for a word, you would pass it through a text-search program. All those super-facilities (those that take Microsoft Word 4.0 and FullWrite Professional almost into the desktop publishing class) would be separate programs that you could call up and use, if and when you wanted them.

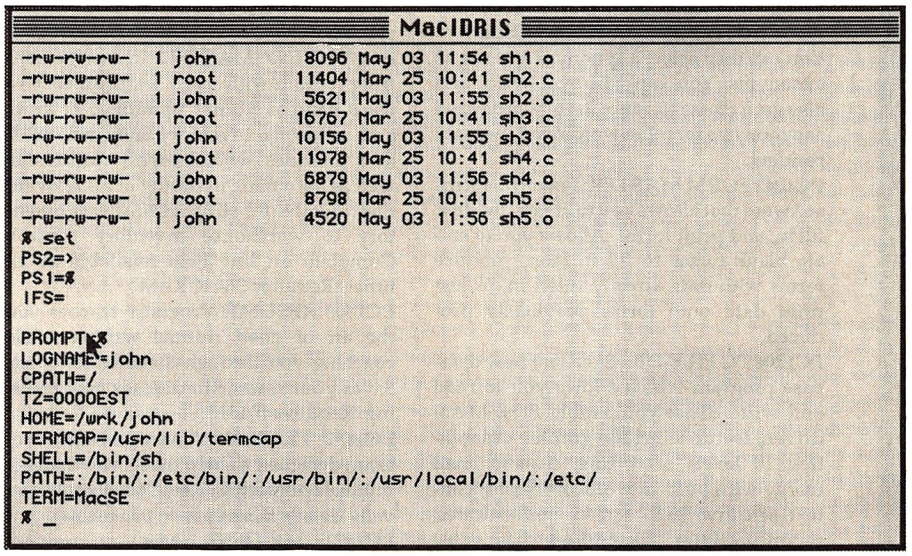
With this approach, your purchased packet of MacWrite disks might give you 30 different text-handling modules – more than you'd ever need. But most of the time you would only be using two or three, or half-a-dozen at the most. The point is that you would still have the whole 30 – with all their complex functions – available whenever you needed them. You wouldn't buy a different word processing package to get the extra or better functions, you would simply buy an alternative (or an additional) module.

One more suppose! Suppose that you had a high-level macro system that let you, as a user (not a programmer) set-up simple chains of these modules – so that the output of the text-entry module was fed automatically into the spelling checker, and the output of the formatting module would go direct to either laser printer, or disk, whichever you decided. And, suppose these chains could be as long and as complex, as you wished – and that overall, you had nearly 5000 pre-written modules to choose from.

Now you have some understanding of what Mac Unix is all about – it is just that Unix has created this plug-in modularity down at the operating system level, rather than as an 'applications shell'. It is easy to see how this approach could provide a



MacIdris, written by Sydney developer John O'Brien, a Posix (IEEE 1003 trial use standard) form of Unix which can run on any 1 Megabyte Mac Plus (or above) with a hard disk, although an SE is recommended.



MacIdris includes two hybrid utilities which allow you to import or export data between Mac and Unix files. The utilities also provide program development tools including C (ANSI standard) and Pascal (ISO) compilers, a debugger, assembler, linker, librarian and related object tools.

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PC1221 dLITE: Memory resident "pop-up" program which gives access to up to ten dBase III compatible applications from within virtually any text based application. Allows you to add entries, display or update records with upto seven indexes, create entry screens, create customised lists, labels, and reports, and more.

PC1253 CONTACT PLUS: Excellent program for keeping track of business contacts. It automatically sorts contacts by surname, postcode, and two user defined fields. It allows you to add unlimited number of notes per contact, and produce personalised letters, labels etc.

PC1602 GENERAL LEDGER II: Full featured general ledger package for professional use in businesses of all sizes. Handles up to 300 user defined accounts, has comprehensive reporting facilities, easy to use transaction entry features, cheque register and audit trail facility, cash journal facilities, password protection, and more.

PC1624 HOME ACCOUNTS: Full featured home accounting system that is easy to use. Online help is available at all times and pop up windows provide you with an easy choice of entries at all times. Bill paying feature reminds you when regular bills are due, and even lets you know if you can afford them. Summarised reports can be produced, and it even projects expenses to help keep you within a budget.

PC1643 THE INVOICER: Complete invoicing and statement generating program for small to medium sized businesses. Allows you to produce invoices on standard paper, and will then post that invoice to the accounts receivable module which will produce monthly statements and provide updated reports for you on your customers accounts.

PC1751 TINY MASTER: Inventory control program with many features. Easy to use it handles storing, updating, viewing, and adjusting inventory information. It also provides several report features as well as automatic updating of all relevant files. Suitable for all uses from home inventory to warehouse inventory control. Complete on line help available at all times. Requires 384 K RAM.

PC1803 RESUME: Program teaches you the art of good resume writing while coaching you through 8 available topics. Saves your resume to disk for easy printing. Requires BASIC.

PC1852 PROPERTY MANAGER: Program designed to help those who manage multiple properties. Keeps track of all relevany details in an easy to use format.

PC1871 MY-DESK: Memory resident "pop-up" utility that includes a powerful editor, an appointment calendar with alarm and daily reminder, a calculator, an ASCII table, and DOS file commands.

PC1875 PRODEX PLUS: Memory resident personal information system that combines a phone manager, to-do list manager, correspondence manager, and a "loose data on the desk" manager in one easy to use program. Not a simple desktop utility, but a powerful productivity tool.

PC1922 TIME TRACKER: Time management and billing package for people who bill their service by time. Allows you to keep track of clients, time spent on their projects, Produces invoices for your services as well as keeping track of accounts.

PC1964 PC-PROJECT: Complete critical path project management application for use with Microsoft Windows. Features pull down menus, mouse and keyboard support, PERT chart, Gantt chart, and text report facilities, and much more. Very powerful. Requires Microsoft Windows 2.0 or higher.

GAMES

PC2061 FORD SIMULATOR: Test drive a wide assortment of 1988 FORD automobiles on your choice of four different tracks including touring, slalom, drag strip, and Grand Prix. Great graphics, and can even be educational.

PC2062 RACETRAK: Horse race game for up to ten betters. Simulates being on the track. Place your bets, watch the race, and let the computer tell you how much you have lost.

PC2063 OFF ROAD RACER: Good graphics game where you must drive your jeep along rocky terrain whilst avoiding the offending motorcycles and shooting obstacles.

PC2064 BERMUDA TRIANGLE: Sail 3 legs of the Bermuda Traingle picking up swimmers and rafters stranded in the water, and finally sail into port. However you must avoid the mystic forces of the Bermuda Triangle.

PC2091 GORILLA BALLS: You are on a constantly shrinking pool table and you must avoid colliding with the gorilla balls coming from all corners. Game gets harder as you play. You need great eye-hand coordination to play this one.

PC2120 NIOSA: Graphics based adventure game. You are at San Antonio Fiesta where you have to eat, drink, and investigate as much as you can to find your friend and be home before midnight.

PC2208 GIN RUMMY: Excelleny computerised version of the old card game. Play against the computer, or if your lazy watch the computer play itself.

PC2209 DRAW POKER: Program allows you to play five card draw poker against the computer. See your cards on screen and bet like the professionals. Provides challenging game for the serious player as well as helping the weaker players sharpen their skills.

PC2210 PONTOON: Good pontoon game with a difference. This game can be loaded as a memory resident "pop-up' program so whenever you get bored and feel like a game of pontoon, hit the hot key combination and play, and when the boss is watching, just press a key and away it goes.

PC2211 TOMMY'S 21: Wise cracking computerised black jack dealer. . Good game play as well as variations to the game. Good fun.

from Freeware

PC2306 FRIGATE: Strategic game which pits you against a Soviet fleet. The object of the game is to destroy as many Russian ships as possible while avoiding destruction. At your disposal you have radar, sonar, jamming equipment, anti missile capabilities, and three types of ordinace.
PC2308 BASS TOUR: Fishing tournament game in which you have complete control of a fully rigged bass boat with all the latest equipment. and your aim is to catch as many fish as possible. Excellent graphics .
PC2309 STAR TREK: Graphics based implementation of the famous Star Trek game. Each player starts with a starbase and up to 12 starships. The object is to map the galaxy, discover planets that have energy and other goods, and avoid the Klingons.
PC2660 CAPTAIN COMIC: Excellent arcade game for those with EGA ststem. You are Captain Comic, galactic hero. Your mission is to recover 3 treasures from the planet OMSOC which have been stolen. Requires EGA video card.
PC2661 CUNNING FOOTBALL: Dynamic, interactive, menu driven football game for EGA systems. Simulates a real American football game as closely as possible. Can be controlled by keyboard, joystick or mouse. Requires EGA video card.

UTILITIES

PC3070 WEAK LINK: Program allows you to connect two computers together via their RS-232 ports and transfer files at speeds of up to 115 kbaud. Good for transferring files between computers with dif-

PC3104 TREEVIEW: Good hard disk and file maintenance utility program. Gives you simple and straightforward commands for manipulating your files, and provides a directory tree view of your hard disk subdirectories and files.
PC3105 GALLERY: Unique DOS menu system and file manager that utilises a graphic interface. You can easily create your own menu, selecting an icon for your application from the library of pre drawn icons. Also the file manager uses friendly and easy to understand icons to make DOS friendlier. Excellent for DOS newcomers and experienced users alike, and will even work on most Networks.
PC3175 BACKUP MAESTRO: Program designed to make your hard disk back up fast and easy. Menu driven program also provides password security, and support for many networks.
PC3291 PRTLABEL: Powerful and flexible label printing program. You can specify label size, number of labels across, and printer model. Supports most printer fonts and even prints borders.
PC3411 BRADFORD: Printer utility that allows you to print ASCII or Wordstar files in very high quality using a number of different fonts on Epson FX, IBM Graphics and Proprinters, and Star Gemini printers. Comes with over fourty fonts including Greek, Hebrew, Jazz, Orator, and more.
PC3415: ON-SIDE: Sideways printing program suitable for Epson and IBM graphics compatible dot matrix printers. Gives you choice of various font styles.
PC3558 PERSONAL C COMPILER: Fast, powerful C compiler. Full featured suitable for all programmers. Includes comprehensive documentation on disk and number of sample files. **TWO DISK SET.**

GRAPHICS

PC5011 DRAFT CHOICE: Object based drawing package. Unlike most drawing programs this program uses floating point mathematical algorithms to record details of objects you design. Allows for extremely detailed drawing, suitable for CAD work, and standard graphics work. Supports Epson compatible dot matrix printers, HP Laserjet, and HPGL pen plotters.
PC5300: ICONVERT: Graphics format conversion program. Allows graphics produced by one program to be used by another. Converts to and from PrintMaster, Printshop, NewsMaster, Newsroom, Fontasy, Macpaint, Windows Paint, and PC Paintbrush. Allows you to view graphics on screen.
PC5610 CHARTS UNLIMITED: Program integrates graphics and text processing into one powerful system to allow quick and easy creation, editing, and printing of flowcharts, organisational charts, floorplans, electrical diagrams, and much more. Program hass library of flowcharting and geometric shapes which can be resized, allows you to create your own objects, print charts vertically or horizontally, import from other programs, and more.

EDUCATION

PC7302 FAMILY 3: Geneaology program which allows you to organise your family tree information and allows you to print it in several different ways including descendant charts, ancestor charts, descendant trees, and more. Requires 320K RAM.
PC8006 SPEED READING: Excellent speed reading tutorial for all ages. Evaluates your current reading speed and shows you how to increase your speed.
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PC8101 CHINESE CHARACTERS: Good tutorial program on how to write Chinese characters stroke by stroke. Covers numbers and several Chinese words.
PC8823 PWRSTAR: Numerical data analysis program. Provides a polynomial best fit to a given set of data. Will provide automatic display of input and fitted curve.
PC9201 NUTRITION ANALYSIS: Program allows for complete nutritional analysis of various types of foods and diets in terms of protein, carbohydrates, cholesterol, fiber, and 15 essential vitamins and minerals. It also produces a customised diet and RDA analysis for you.
PC9354 MAYAN CALENDAR: Program uses the astrological system of the Ancient Mayans to convert modern calendar dates to their Mayan equivalent, and then give an astrological interpretation based on ancient Mayan astrological techniques.

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To order any of the software on these two pages just send your name , address, and a list of the programs you want along with payment to

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very flexible system for customising your requirements – and unique applications are what universities are all about. When they needs something completely new they write another module in the C language (or Pascal or Fortran), and slot it into the chain ('pipe') along with the others. It just plugs in, and only does the minimum required.

The key to Unix is modularity – once you've got Unix on your computer, you (a user, not a programmer) can create an amazing range of applications yourself.

This flexibility is all only possible if the operating system doesn't impose constraints on the data; that is, if it provides a minimal 'shell' structure only. If you are going to have clipboard and desk accessory programs that work despite the resident application, then these have to be built-in to the operating system. If you want WYSIWYG screens on your text editor, then this needs to be built-in to the program. Unix has a philosophy of keeping everything simple, and performing all functions possible as 'processes' – that is, through the performance of utilities.

For instance, Unix sees files as just a series of bytes – it doesn't require that its data should be supplied in blocks, and it doesn't differentiate between directories and devices. It provides the minimum services necessary to keep the computer operational, and relies on an extensive range of processes (utilities/application modules) to do the rest. There are two levels of Unix on the Mac at the present moment, MacIdris and Apple's own A/UX.

MacIdris

MACIDRIS is a Posix (IEEE 1003 trial use standard) form of Unix which can run on any one-megabyte Mac Plus (or above) with a hard disk, although an SE is recommended. The program needs 40K of RAM space for the 'resident' which is responsible for scheduling, system calls, I/O and file system services, and an extra 54K for buffers and working storage.

MacIdris runs as a task (as if it were an application) on top of the existing Mac operating system, and at the present moment it comes with about 100 utilities including line and screen editors, file and text manipulation tools and a powerful text formatter. There are two hybrid utilities which allow you to import or export data between Mac and Unix files. These utilities also give you access to LocalTalk.

The utilities package also provides you with program development tools including C (ANSI standard) and Pascal (ISO) compilers, a debugger, assembler, linker, librarian and related object tools.

John O'Brien, the manager of Whitesmiths Australia developed MacIdris following a pattern set by the 10-year old Idris Unix-compatible software originally on the DEC PDP-11 and later on the Vax. It was the first Unix-compatible that didn't come under the control of Western Electric (AT&T).

MacIdris is a true multitasking, multiuser system. If you've got two serial ports, more than one user can access the software simultaneously. Multi-tasking almost goes without saying on a Unix system. If every program module had to be run in sequence and only handed on to the next after completing all its work, Unix would become very slow. So multitasking is at the heart of Unix.

However, the priority of each module will not necessarily be the same, and so at the centre of MacIdris 'resident' is the task scheduler which handles the allocation of processing time on the basis of deterministic principles (fixed priorities) or varying timesharing priorities. Tasks with the highest priority will run to completion before handing over the system to other lesser tasks, while at the lowest level batch tasks will run in background.

Apple's A/UX

AT A MUCH higher level we have Apple's own A/UX which needs at least two megabytes of RAM (preferably four), an 80Mb hard disk, the PMMU chip and the latest in ROMs, all together on a Mac II. As compensation, Apple provide you with a suite of 4683 files (which themselves occupy 43Mb of space) and a library of documentation to the limit of human endurance – 6000 pages in 12 binders – most of which is AT&T documentation and is also available on-line.

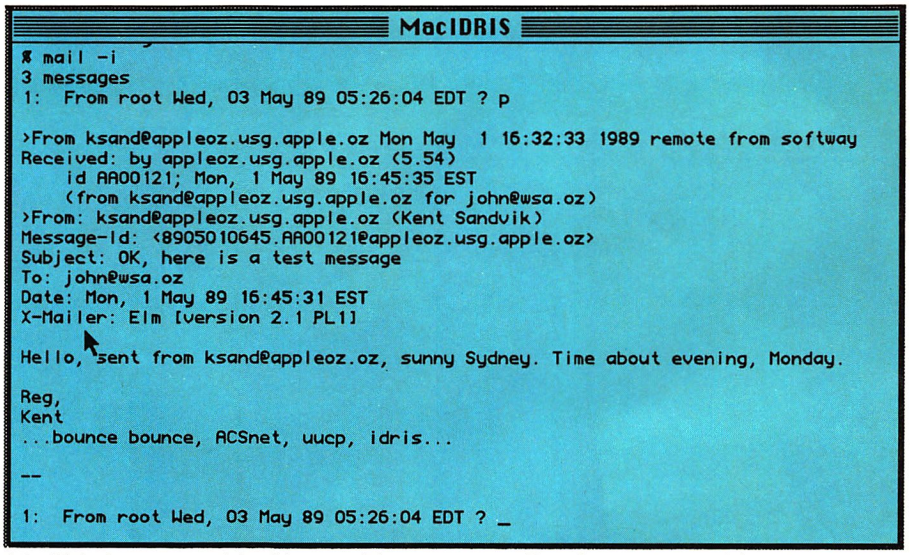
Apple's approach to implementing Unix is quite different to Whitesmiths'. A/UX is a full-featured version of System V with the addition of Berkley 4.2/4.3 enhance-

ments, such as the TCP/IP communications protocol code. The system was developed primarily by Unisoft Corp in the States and it has been aimed to sit squarely between both major Unix camps.

For the technical/scientific workstation market, A/UX also uses Apple's own Ethernet card and supports BSD's TCP/IP for internets, and Sun Microsystem's Network File System .

Although A/UX on the Mac doesn't yet have the look and feel of the normal Mac interface (they are still working on that), it does still have access to most features of the Toolbox, and so applications developed for the system can be designed to have Mac-like features. At the same time, the designers have managed to 'reverse engineer' the operating system so that it can run standard Mac applications like MacDraw – which shows how closely the developers have followed Apple's compatibility guidelines, at least!

To date, there have been only a few problems and a few notable omissions with the introduction of A/UX. There was some early problems with NuBus cards (actually a bug in the ToolBox) which were solved by updating the Mac II ROMS, and apart from the lack of an iconic interface (MacNix is on the way) the most notable omissions have been with colour (ColorQuickDraw is coming soon), the lack of support for AppleTalk (a special card needed) and the 40Mb tape drive, and the lack of a multi-tasking ToolBox. □



MacIdris is a true multitasking, multiuser system – if you've got two serial ports, more than one user can access the software simultaneously. Multi-tasking almost goes without saying on a Unix system.

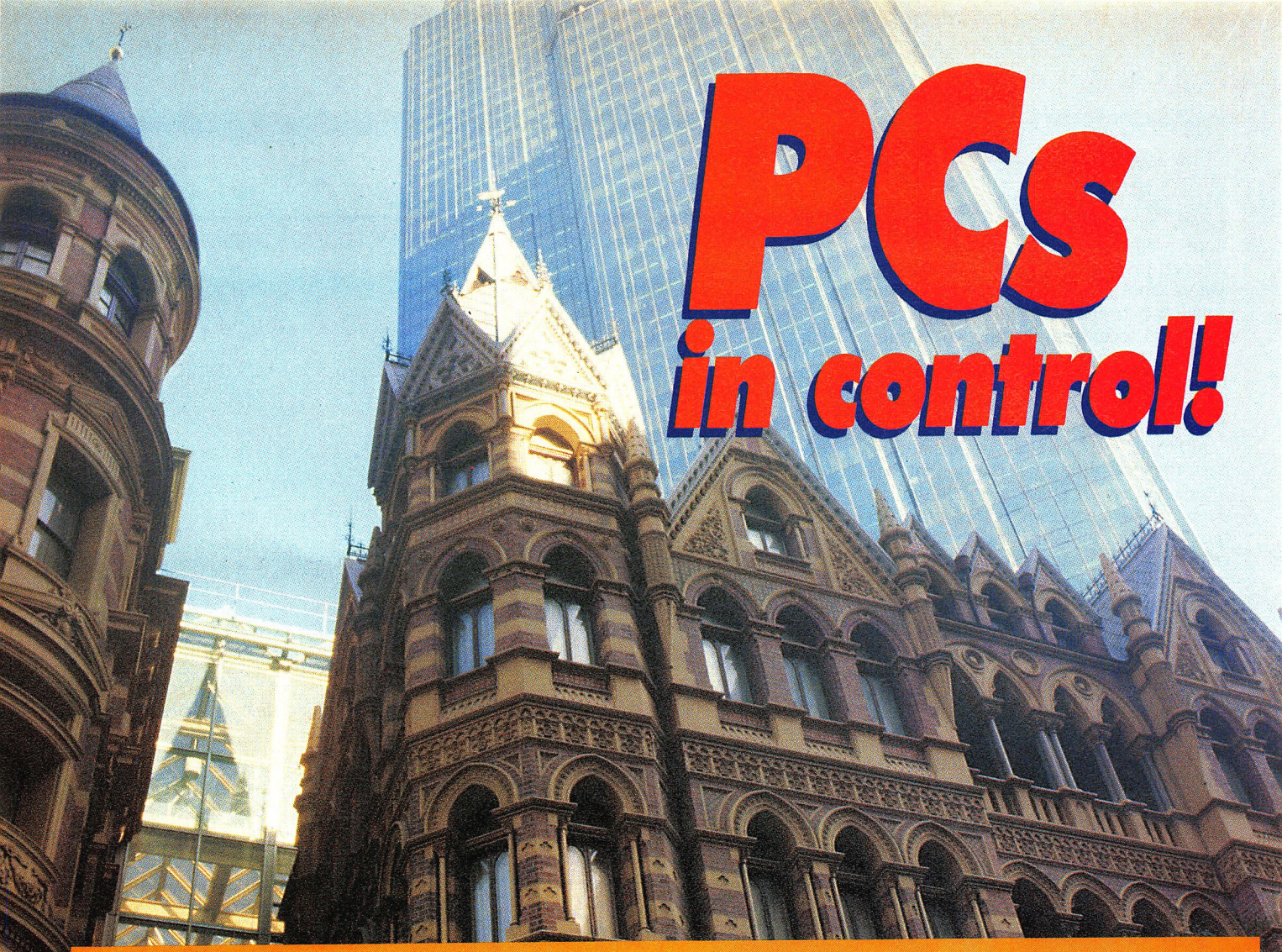
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PCs in control!

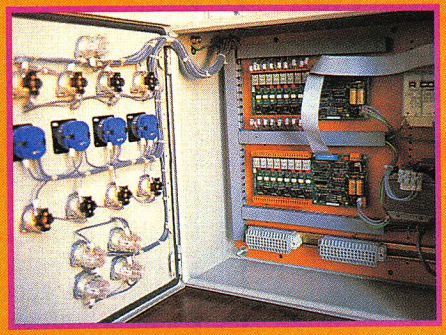


There's much more to computer applications than data crunching and word processing – a Melbourne-based company is putting PCs in control of the factory floor, fire protection systems, office automation systems and even model railroad sets!

MANY DEVICES and systems are computer-controlled, even though it may not be immediately obvious. This includes such mundane things as washing machines, air-conditioners and vending machines, and extends to more exotic applications like aircraft systems, traffic control systems and the control of buildings.

The Rialto building in Melbourne is a good example of how light and power, fire management and protection, and the building's mechanical services such as lifts and air-conditioning, can be brought under control of one central computer system. Over 20,000 control points (inputs and outputs) are available to the computer system. Open the fire escape door on the top floor, or request entry on the ground floor, and the system is aware of it and is capable of displaying the changed conditions withing seconds.

The advantages of computer control are in its ease of installation and maintenance, its improved reliability and reduced downtime. The most significant advantage over hard-wired systems is in the way changes can be made to the controlling functions simply by altering the computer's program.

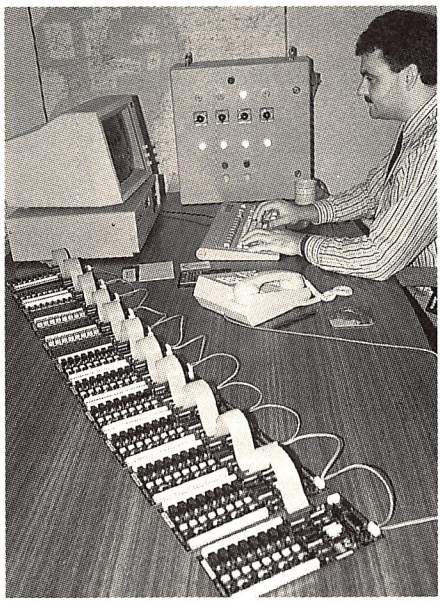


ProCon's system can be externally mounted and is expandable to 120 inputs or outputs which can connect to any bi-directional parallel printer adapter. Additional cards and I/O boards can be installed to give a potential of handling over one thousand inputs and outputs, all controlled by a single computer system!

Another significant advantage over other forms of control are the ease with which information can be stored, displayed or printed out for more effective management, security and safety. And, if that isn't enough, the mass production of computers such as the IBM-PC, and its army of clones, has made it economical to use it in small dedicated applications. Such applications might include model control, home or office security systems, energy management or in quality testing.

On the floor

THE IBM PC and its workalikes certainly suited for use in the home, office, school or laboratory, but what about the hazardous environment generally found



Melbourne's Rialto building has over 20,000 control points (computer inputs and outputs) for light and power, fire management and protection, and the building's mechanical services such as lifts and air-conditioning. Open the fire-escape door on the top floor, or request entry on the ground floor, and the system is aware of it and is capable of displaying the changed conditions withing seconds.

on a factory floor? This is where numerous manufacturers have stepped in with industrial packaged versions of the IBM-PC, in single or multi-board configurations, fully compatible and ready to run in the most extreme conditions.

If the environment is too extreme for a disk (high temperature, high vibration, high levels of dust), then bubble-memory or solid-state Read Only Memory (ROM) can be used instead. MS-DOS can be installed in ROM, making the entire computer system solid-state and very reliable. This means that all of the resources available at an office desk are now available on the factory floor.

Interfacing

IN THE 'real-world', high-voltage and high-current control devices must be switched on and off to carry out their functions. These devices are generally not compatible with the low-voltage logic level signals of the computer system, typically 0 to 5 volts. Also, input voltages of 12 to 48 volts DC and up to 240 volts AC are commonly used. So, an interface system is needed between the two.

An Australian company, ProCon Technology, saw the need for an easily connected, easily expanded I/O board system for the IBM-PC and other micro-computers. The company has designed a full range of digital, 'real-world' I/O boards to control a wide range of processes from an IBM-PC or other compatible systems. The boards can provide the high-voltage (up to 380 VAC) and high-current (up to 10 amps) outputs needed for switching lamps, relays, solenoids, motors and so on. At the same time they can be configured to switch low-current, low-voltage analogue signals for applications in telecommunications, audio and video signal switching and test and measurement systems.

The digital input and output system designed by ProCon not only provides electrical isolation between the computer and the attached I/O devices, but also between each individual input and output – this provides a great deal of flexibility in system design. The importance of isolation is not just in providing protection to the computer against the high-voltage and current transients that may occur, but also in providing greater immunity to electrical noise and interference.

The resulting system is externally mounted, expandable to 120 inputs or outputs and connected via a single 25-way cable to any bi-directional parallel printer adapter (PPA) port on a PC. And if that isn't sufficient I/O, then additional PPA cards and I/O boards can be installed giving the potential of handling over one thousand inputs and outputs, all controlled by a single computer system!

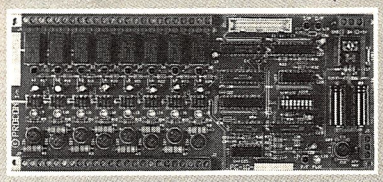
A program to control these inputs and outputs can be written in Microsoft Basic, C, Pascal or Fortran, TurboBasic or Pascal, GW and QuickBasic and QuickC – in fact, ProCon provides a disk with each board that has examples and drive routines in all major PC languages. The program is used together with the high-speed subroutines (provided with the I/O boards), which read all the input conditions and update all the outputs. Using the logic operators of any of the programming languages mentioned, the necessary control equations can be derived.

These examples, written in Microsoft Basic, show how straightforward the equations can be (note that all variables are integers) –

Y(&12) = X(&23) OR X(&34)

– output 2 on card 1 is activated if either input 3 on card 2 OR input 4 on card 3 is ON.

Boards with control



PROCON'S range of digital I/O (input/output) boards, the PC-IO-*xx* series, operate through the parallel printer port of an IBM-PC or compatible using their PC-BD-IO interface card ($95 plus $35 for 3 metres of cable). The general purpose board, the PC-IO-NR-24VAC ($290), provides isolated 24V AC or DC inputs and voltage-free relay contact points.

Other stock options include 240 VAC/10A relays, 20 to 240 VAC/1A solid-state relays, AC/DC photo-voltaic relays, and isolated TTL level outputs; boards can be custom-designed for particular applications. Latest addition to the range is the industrial option ($490) which has plug-in screw terminals, plug-in relays and other features to cope with a harsh industrial environment.

ProCon will supply their general purpose -NR board to government departments, schools, institutions and approved businesses for evaluation on a 30-day trial basis. If you'd like to know more, contact them at –

ProCon Technology,
PO Box 43,
Essendon 3040 Vic.
(03) 336 4956

Another Melbourne company is supplying ProCon's boards with their Little Board/286, which has the functions of an AT motherboard (8 or 12MHz) plus disk, serial and parallel port controllers on a single board the same size as a 5¼ inch drive. An optional video controller (EGA, CGA, MDA or Hercules) can be installed directly on the board.

The board provides sockets for up to 256K of EPROM or up to 1Mb of battery-backed RAM, either of which can be used to function as a DOS-compatible solid state disk drive. For more information, contact –

Current Solutions,
12A Church St,
Bayswater 3153 Vic.
(03) 720 3298.

Control your home!





ARCHITRONICS – add that to your jargon dictionary because you'll be hearing a lot more of the concept in the next few years. Simply put, it's the integration of architectural design with electronic technology. A Melbourne-based company has applied the concept using ProCon's boards and an IBM-compatible computer to develop their Home Automation System which uses architronics to interface a home's electrical wiring and a PC. While the most integrated and transparent system would, of course, be designed into the building at the planning stage, a fully functioning system can be set-up in most homes with a minimum of disruption – in fact, the PC doesn't even have to be dedicated; the system can run as a background task. And, the Home Automation System is fully compatible with the range of Smart Appliances that should hit Australian shores this year.

Using a variety of sensors, the system monitors light levels, movement, sounds such as those made during a forced entry, smoke, carbon monoxide and other gases, temperature, moisture and atmospheric pressure. Additional sensors can be used to measure the presence or absence of water or other liquids, the presence of a vehicle in the driveway, or when someone is approaching the front door.

The developers have put all this into a package that can –

□ Maintain the light level in a room: if it's daylight outside, the system will open the drapes or shutters and then selectively turn on lights until the pre-set light level is reached in all or part of a room when someone enters it and turn them off if there is no activity in the room for a certain time.

□ Control heating and cooling: depending on the time of day, the system can control the temperature in specified rooms (like warm the kitchen – and turn on the percolator – shortly before you awake; then keep the house at maintenance temperature during the day and warm (or cool) it just before you're due home. But, there's more to the system than simply turning heaters and air conditioners on and off – blinds and shutters can be opened and closed, a system of fans and vents, coupled with wind speed and direction sensors, can be used to move air from cooler to warmer parts of the house and to draw in and extract outside air. This same setup can be used to control the humidity in bathrooms and the laundry.

□ Security: as well as the standard security functions (turning lights and music on and off at random times, auto-dialing in response to fire, illegal entry and personal distress alarms), PIN numbers can be used for a variety of functions. These include allowing the children to turn on the TV at a pre-set time, but not to use cooking appliances until you return home and key in your own number; and, the cleaner's or gardener's PIN numbers can be made valid only at certain times.

Sound interesting? For further information contact –

SHAPES
578 City Rd,
Sth Melbourne 3205 Vic
(03) 696 2894

or

MIDAC Technologies
147/313 Harris St,
Ultimo 2007 NSW
(02) 692 9112

Other applications include swimming pool temperature control and chlorine monitoring, automatic garden and indoor plant watering and displaying who's at the front door on the TV screen (the same system set-up can be used to check on the kids in the swimming pool).

Y(&12) = (Y(&12) OR X(&12)) AND NOT X(&13)

– this provides a latching function: when input 2 on card 1 is momentarily ON, output 2 on card 1 goes ON and remains ON until input 3 on card 1 is momentarily activated.

Y(&23) = (TIME$ > "08:30")
AND (TIME$ < "09:30")

– this provides a time-of-day controlled function: output 3 on card 2 is activated between 8:30 am and 9:30 am everyday.

IF X(&24) AND NOT C1 THEN C = C + 1
C1 = X(&24)

– this provides an input pulse counting function: whenever input 4 on card 2 makes an OFF to ON transition the counter variable C is incremented.

The control program, once completed, can be compiled and then executed when required. Programs can also be made memory resident, such that the controlling function continues in the background whilst the computer is used for other things.

ProCon's board are being put to work in such diverse areas as boom-gate control and audio and video switching. In one of the more recent applications, Port Melbourne-based Architronics have designed a home automation system based on ProCon boards. The system will individually monitor all doors and windows and provide central control for lights and dimmers. Other features include automatic heating and cooling control, an automatic sprinkler system, and control of a closed circuit TV system.

The PC, and its many compatibles, is dominating the computer race in the office and it's clear that it will dominate in control applications as well. After all, why not make use of the multitude of programming languages, aids and public-domain software that's already available for the IBM PC to solve those many control problems? The range of computers and I/O boards currently available also makes the PC attractive for use in small dedicated applications. □

Automail

Ever tried to mailmerge files from different word processors? Ewart Stronach has – but he's found an easy way (which includes a postcode generator and mailing list manager, too!).

AUTOMAIL IS AN innovative approach to a problem faced by many large word processor users, that of converting mailmerge files generated for other word processors. More than that, you get a memory resident postcode generator, which will look up any Australian postcode and export it to your current application, plus a full mailing list manager and label printing utility.

Those of you who run large mailmerge files in conjunction with either WordStar, WordStar 2000, Microsoft Word, SSI WordPerfect or Ashton-Tate's Multimate would be aware of the problem in modifying the data files they create. Worse, if you run more than one of these word processing packages, you would know that the data files are not interchangeable and must be laboriously re-entered for each application. It is not uncommon for two branches of an organisation to run differing word processing programs and the ability to share a client database would be a distinct advantage.

Automail will stand alone as a simple to operate mailing list manager, offering a fully structured database of all your clients', clubs' or friends' names and addresses. The available fields offer enough scope for most users and include surname, first name, initial, salutation, title, two address lines, town and postcode.

Four user fields may be used for comments or categories for later sorting. All sounds pretty straight forward and just like any other mailing list program you've seen, right? Yes, but here's the first *big*

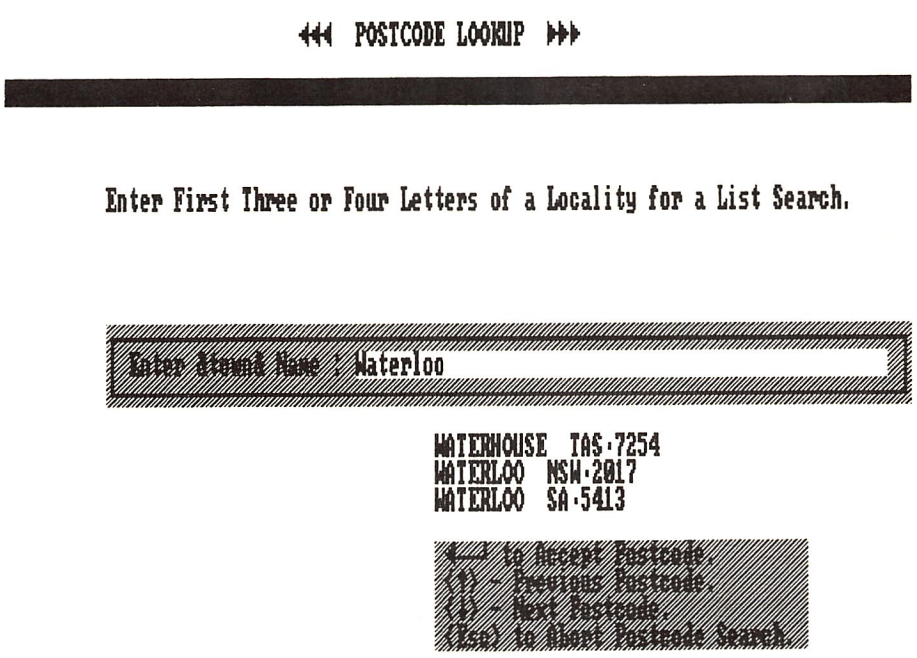


Figure 1. As you type in the town, the postcode is automatically generated and entered into the appropriate field.

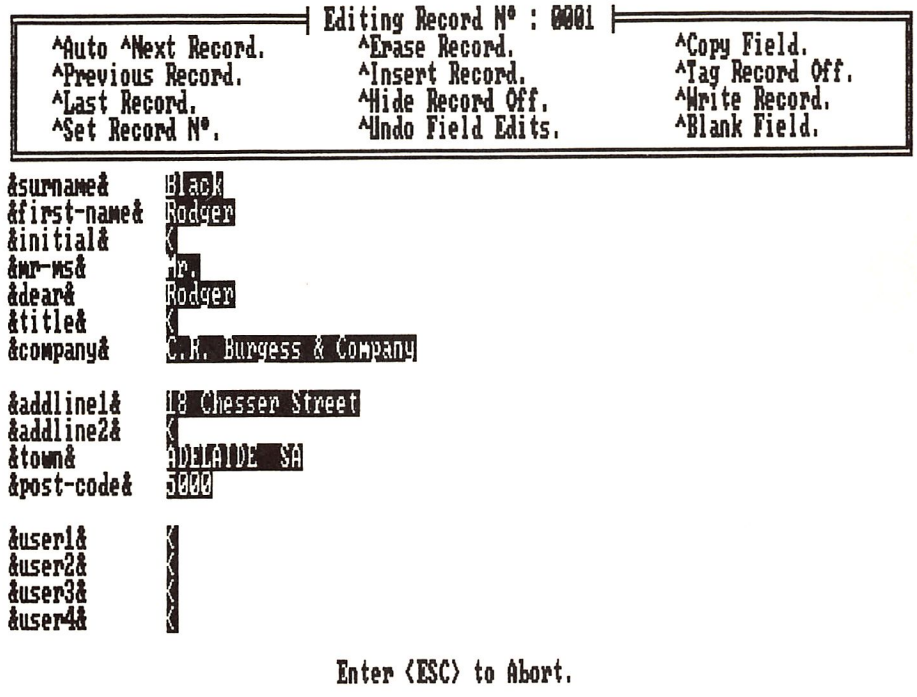


Figure 2. In Automail's editing mode, all the usual functions are available and clear instructions remain on screen in a top menu bar.

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MW045: PRINTING AID FOR WORDSTAR Do subscript, change line spacing and more. Not compat. with Amstrad W/Star.

MW024: LETTERHEAD/GRAB. Design your own letterheads, envelopes/ logo. Grab-point at the address on the letter, grab it and print an envelope.

MW051: LASER FONT FILTERS. Convert soft fonts of LJ and produce hollow outlines and 3D effects with shadows.

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MU034: MAGIC MENUS. Excellent DOS front end, lets you create your own menus, pop up windows for file listing, directories, full screen editing.

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ML034: PC COBOL COMPILER.

ML029: MACRO ASSEMBLER. MASM.

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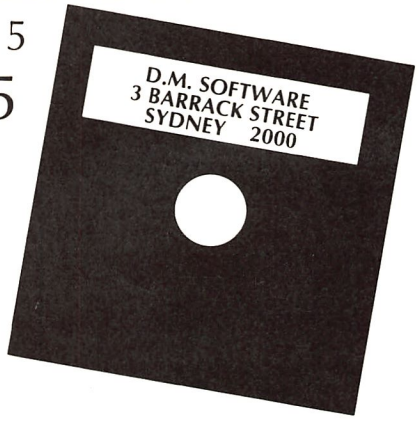
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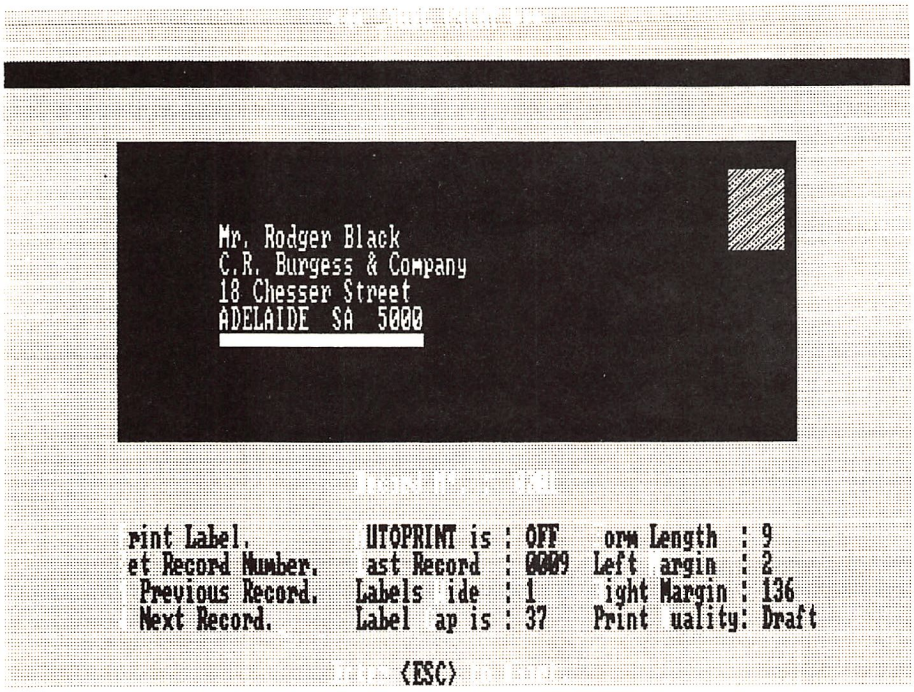


Figure 3. *For printing labels, a screen with a graphic representation of an envelope with the first name and address from the selected database displayed appears. A single label may then be printed, either onto standard self adhesive labels or direct onto an envelope.*

plus. As you type in the town, the postcode is automatically generated and entered into the appropriate field. If there is any ambiguity, the possible towns are displayed and the correct one selected with the arrow keys.

It would be easy to buy Automail for this function alone, but its primary function is that of a utility which no serious user of mailmerge facilities on any of the supported word processors should be without. Your existing mail lists, generated by your word processor may be viewed, edited, sorted and re-written for another application with ease.

Editing mode

In the editing mode, all usual functions are available and clear instructions remain on screen in a top menu bar. Control keys are used to select functions such as moving to the next record, erasing fields, copying fields or even hiding fields before writing that particular mailing list out to a file which may be accessed by your chosen word processor.

If using the program as a stand alone unit for producing mailing labels, no word processor is needed and a full range of printing options is offered. By selecting Label print, you are confronted with a screen with a graphic representation of an envelope with the first name and address from the selected database displayed. A single label may then be printed, either onto standard self adhesive labels or direct onto an envelope if your printer will handle them.

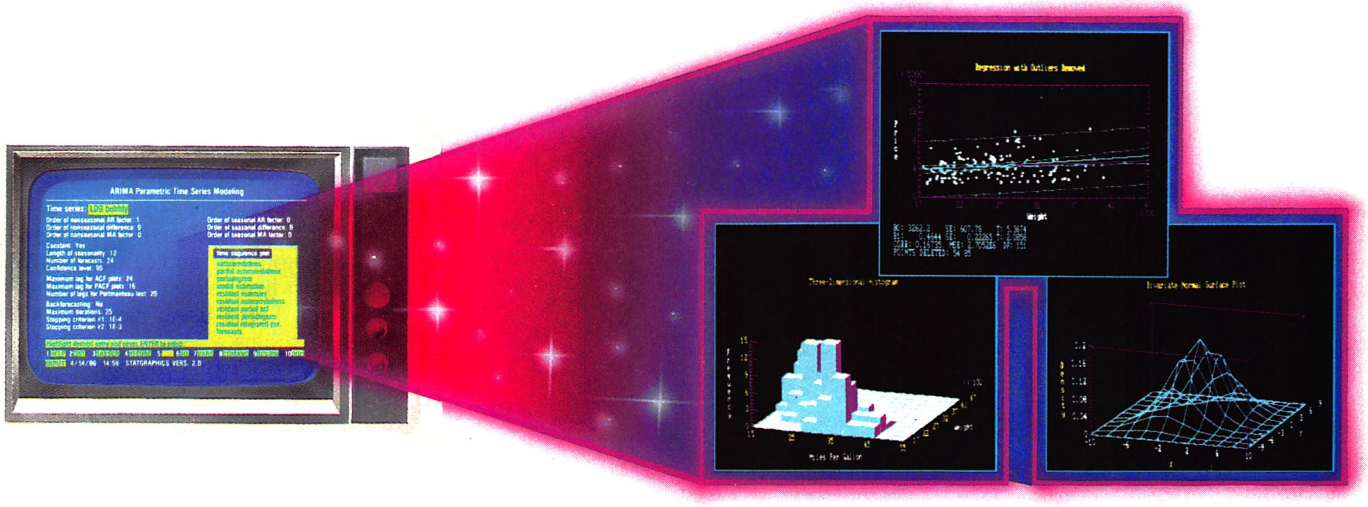
Selecting Autoprint will print all the labels in that particular database and it is a simple task to filter through the database to select any number of criteria for printing. The placement of the labels is simply adjusted to suit your needs, and Automail can handle labels up to three across on your printer.

The program is easy to install and both a memory resident version of the postcode data and a 'look up disk' version are supplied. The most convenient, of course, is the fully resident version, but it's a little memory hungry. Most applications of this piece of software would be on a computer almost dedicated to word processing. □

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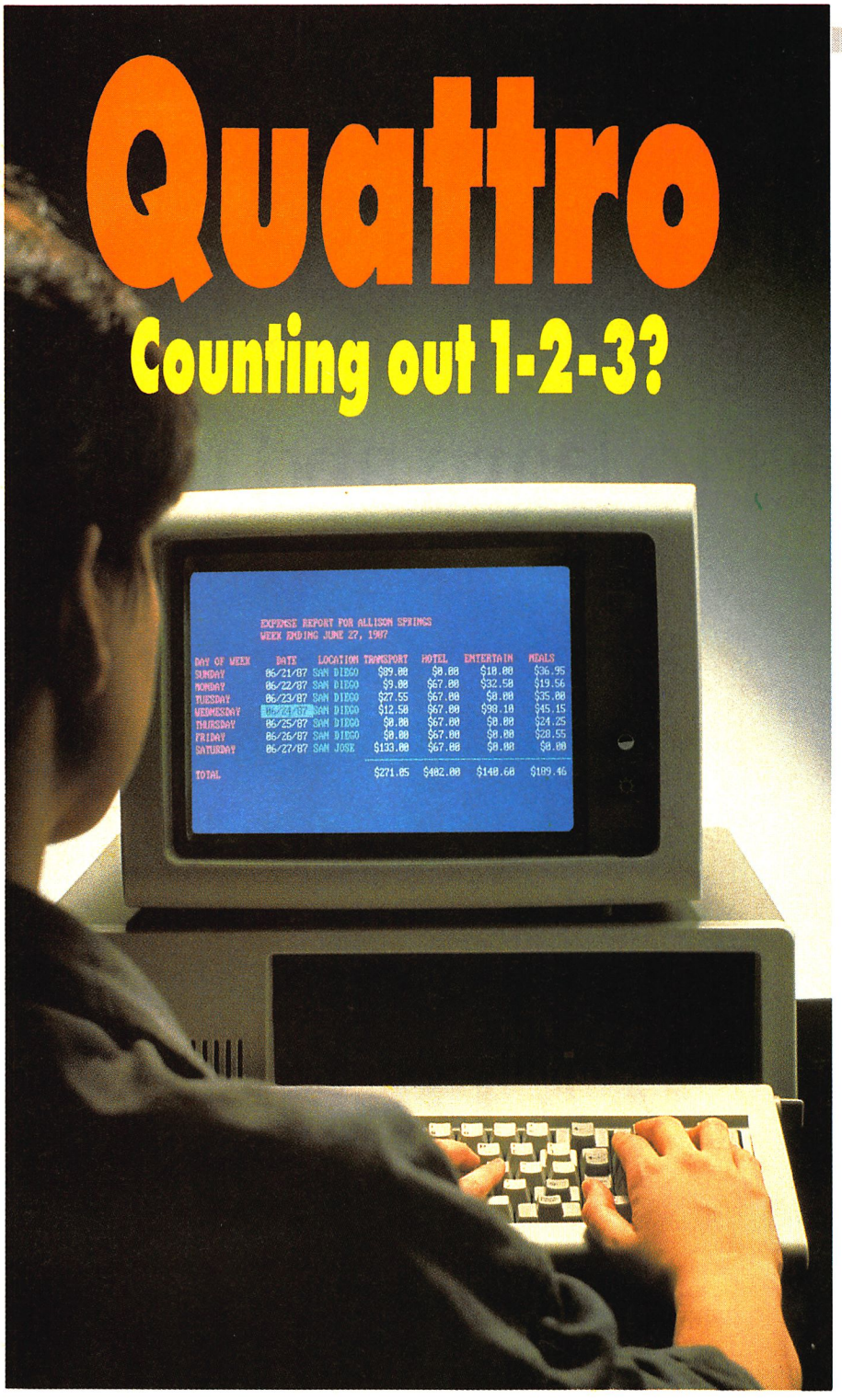
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Quattro

Counting out 1-2-3?



BORLAND, ONE of the great names in the software business, has taken on the might of Lotus with their spreadsheet Quattro. Borland has produced a string of innovative programs at remarkably low prices; Lotus has produced one runaway bestseller and other less successful products, at high prices, and some of them with frustrating forms of copy protection.

Lotus is loosing its command of the spreadsheet market – and this full-featured, low-priced offering from Borland is one good reason.

All the companies that have tried to tackle Lotus head-on have used the same formula: *1)* Provide more features than Lotus; *2)* Set the price lower than Lotus; and *3)* Change the command sequences around a bit to avoid being sued by Lotus.

If you have more features and a lower price than Lotus, how can you lose? Quite easily, as the past has shown – no one has managed to break the stranglehold Lotus has on spreadsheets; the incentive to change hasn't been enough to outweigh the need for learning a new set of commands. (Although the non-appearance of the long-promised Lotus version 3.0 has shaken corporate faith in the company.)

Enter Borland – it calls Quattro 'The Professional Spreadsheet', and I believe' professional' is the right word to describe it. Every part shows evidence of the great care that has gone into its three-year gestation period. But all this would be wasted if Borland hadn't also given thought to the question of how to break the inertia of current Lotus users.

Borland has produced a program that can be customised, and customised again, to look just like Release 2.01 of Lotus 1-2-3! So you Lotus users can use Quattro without learning a whole new set of commands. What's more, you can do as little or as much customising as you like. Actually Quattro is so much better than 1-2-3 that you may decide to use it in its original form.

Now let's get down to details. You install Quattro simply by creating a new directory on your hard disk and copying the four diskettes to it (Quattro can be used on a floppy drive system). The software automatically detects the hardware being used and installs itself accordingly.

There are a few exceptions, such as if you use a monochrome monitor with a colour graphics card, but generally the program copes well with most situations. I am using a Compaq Portable III and from one of the manuals I found that I should specify loading the AT&T 400-line driver to get the best results on the Compaq's gas plasma screen. The program makes some sensible assumptions,such as the printer is a parallel machine attached to LPT1:.

Quattro comes with three manuals: *Getting Started* covers the preliminaries, has a guide for 1-2-3 users, and a six-lesson tutorial that covers the major features. The *Reference Guide* is a set of four alphabetically arranged chapters on Menu Commands, @ Function Commands, Macro Commands and Menu Equivalent Commands (commands used to represent

menu commands in macros and transcripts). Finally,the *User's Guide* contains 13 chapters covering each of the major parts of the program. Sometimes it is a little hard to work out which guide contains the information you want, but there are copious cross-references and good indexes. There is even an appendix called a DOS primer which would be most useful for those for whom this is their first computer program. It is packed with practical information on such topics as creating and changing directories, setting-up a pg prompt to show what directory you're in, and how to create an AUTOEXEC.BAT file.

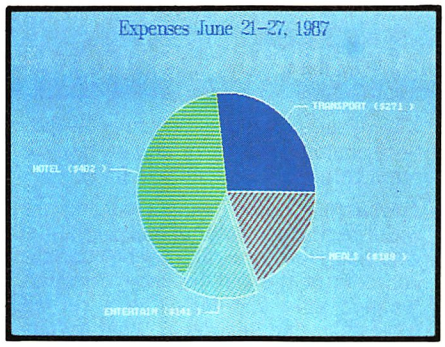
In addition the *Reference Guide* contains a wealth of information: all the Quattro commands and their menu equivalents; all the Lotus commands and their menu equivalents; the same information displayed the other way round (menu equivalent, Quattro menu and Lotus menu); mode and status indicators; direction keys; function keys; other special keys; printer setup strings for Epson matrix-printers and Hewlett Packard laser printers; ASCII codes; and error messages. While it is true that you can find some of this information elsewhere, what I find worthy of note is that it is all contained in the one package. You could buy a personal computer and Quattro and not need any more reference material (nevertheless, Borland and McGraw-Hill are advertising three how-to books on Quattro, I see.)

The *Reference Guide* also has a set of fold-out charts (called Menu Trees by-Quattro) showing all of Quattro's commands. There are four of these, showing Quattro's Menu Tree, Quattro's Graph Menu Tree, the 1-2-3 Menu Tree, and the 1-2-3 Graph Menu Tree. Set out this way,-the range of commands available is somewhat overwhelming. On the two 1-2-3 Menu Trees, a square bullet denotes the numerous functions that have no counterpart in 1-2-3 – this is quite an impressive indication of the differences between the two programs.

When you load Quattro you have the choice of loading Quattro's Menu Tree or the 1-2-3 Menu Tree – the 1-2-3 Menu Tree is basically the same as 1-2-3's with Quattro's extra commands added.

In command

SOME OF the commands are invoked with the same keys as 1-2-3, /FS and /FR for instance. Others are quite different,



Graphics are completely integrated with Quattro, and offer a choice of ten kinds of graphs: line, bar, XY, stacked bar, pie, 3-dimensional bar, area, rotated bar, markers, and combined lines and markers. The graphs are of presentation quality; the options available should be more than enough for most users. Named graphs are stored with the spreadsheet, and changing the spreadsheet data changes the graph.

but are easy to pick-up from the pop-up vertical menus, which seem to me to beeasier to read than the horizontal ones used by 1-2-3. They are arranged non-alphabetically, presumably with those used most at the top. Some program makers have had to strain to come up with menu choices which all start with a different letter; Quattro have managed well here.

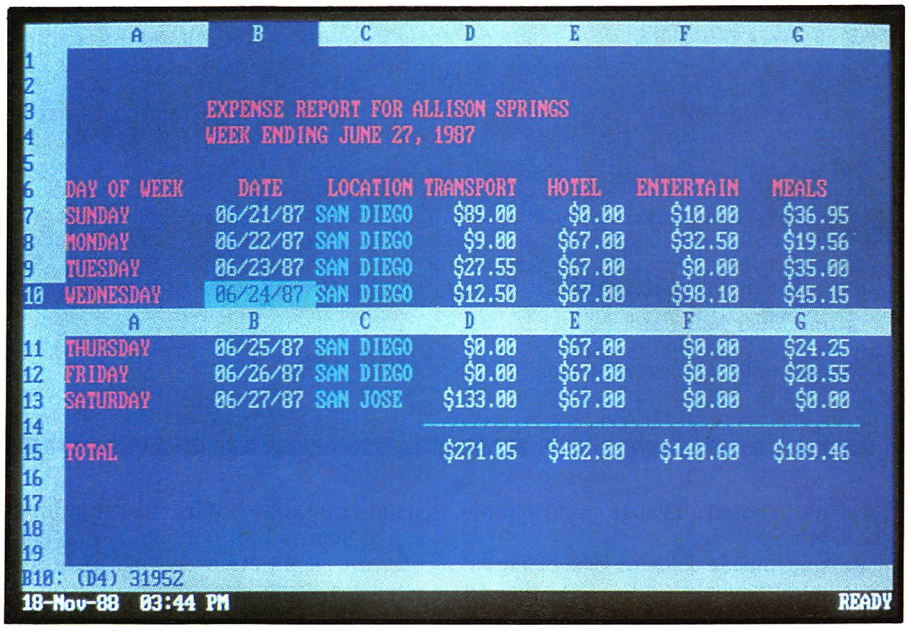
Featuring

ONE OF Borland's innovations is their 'No-nonsense Licence Statement'.-The gist of this is that 'you must treat this software just like a book', meaning that it may be used by any number of people and freely moved from one computer location to another, so long as 'there is no possibility of its being used at one location while it's being used at another'. This is commonsense without legal jargon – a refreshing change.

Of course Quattro has context-sensitive help; its only peculiarity is that (according to the manuals) you leave Help with Ctrl-Break – fortunately Borland must have had a change of heart, because the conventional Esc works as well.

Shortcuts are available to avoid lengthy key sequences, any of which can be assigned to a Ctrl-key sequence.

With most programs you need to translate a file from one format to another; Quattro is supposed to take care of the common translations automatically. I say 'supposed to' because when I loaded a 1-2-3 file into Quattro the result looked decidedly strange – the translation handled everything except column widths; some, but not all, finished-up in Quattro much wider than they should have been. Because I also had 1-2-3 available, I was able to correct this easily, but there didn't seem to be any obvious reason why some



EXPENSE REPORT FOR ALLISON SPRINGS
WEEK ENDING JUNE 27, 1987

DAY OF WEEK	DATE	LOCATION	TRANSPORT	HOTEL	ENTERTAIN	MEALS
SUNDAY	06/21/87	SAN DIEGO	$89.00	$0.00	$10.00	$36.95
MONDAY	06/22/87	SAN DIEGO	$9.00	$67.00	$32.50	$19.56
TUESDAY	06/23/87	SAN DIEGO	$27.55	$67.00	$0.00	$35.00
WEDNESDAY	06/24/87	SAN DIEGO	$12.50	$67.00	$98.10	$45.15
THURSDAY	06/25/87	SAN DIEGO	$0.00	$67.00	$0.00	$24.25
FRIDAY	06/26/87	SAN DIEGO	$0.00	$67.00	$0.00	$28.55
SATURDAY	06/27/87	SAN JOSE	$133.00	$67.00	$0.00	$0.00
TOTAL			$271.05	$402.00	$140.60	$189.46

B18: (D4) 31952
18-Nov-88 03:44 PM READY

Among the features that will be welcome to 1-2-3 users of Quattro is that the program warns if changes have been made but not saved; and 'intelligent recalc' which recalculates only those formulas that have been changed instead of all of them (a great time saver).

Spreadsheet shopping?

BEFORE YOU GO shopping for a spreadsheet, make notes of your own specific requirements. Demonstration programs are all very well, but they can only give an overall impression and are notorious for showing off the best features – features that may be of no use in your work. You or your staff will be using the program, so try it to make sure it does what you want, and does it as easily as possible. The following is a checklist of features and functions to look for –

Setting-up: Before you go shopping, draw-up a sample spreadsheet with your own specific type of data in it and take it with you – it'll save a lot of time and give a basis for comparison after you've looked at several programs. Of course, if you don't already have a spreadsheet (or have a little-known one), you may have to enter the data several times as you shop around, but that's a good way of getting a feel for the program and spreadsheets in general; once you have the data entered on disk from several different programs, it can be used as a test for importing and exporting. Try using formulas: can they be applied by moving the cursor to a cell as well as by entering the cell's address?

Moving the cursor: Move the cursor from the top left corner of the screen, to the bottom right, and back again, to see how quickly you can move around. Look for a Home command to return the cursor to the top left corner from any place on the spreadsheet (or to another cell you can specify). Is there a 'page down' and 'scroll right' function – these are real time savers if the spreadsheet is larger than one screen?

Cell editing: Move the cursor to a cell that holds a formula, and change it. Try changing your mind half way through the change. Entering and editing data will most likely be the most used functions, so they should be the easiest.

Online help: You need help when you need help, so getting it should be easy. Try getting help on entering data, recalculating, writing a formula and titling the rows and columns of the spreadsheet. When you ask for help, do you get a context-sensitive answer, or do you have to scroll through a general help file?

Formatting cells: Trying changing the width of a single column and a group of columns. How wide can they be? Can the contents of the cell be shown centred, justified right and left? Can a cell be more than one line deep? What formatting choices are there for numeric data – if you enter a number, can it be automatically formatted to dollars and cents, or a designated number of decimal places, or scientific notation? Can calculations be done with date and time-formatted cells, that is, can the spreadsheet work out the number of days between two dates, months apart, and use the result in a calculation?

Printing: Try printing your sample spreadsheet. Can you print it in landscape mode (sideways – this is almost essential if the spreadsheet is over 80 columns wide). What is the default format for printing negative numbers? Can you change it? Is condensed type available – this makes it possible to get up to 96 spreadsheet columns on 80-column paper. When printing in portrait mode, is it possible to define where the breaks in the spreadsheet will occur? Is it possible to force page breaks? Is it possible to print only a nominated portion of the spreadsheet? Does the program include a driver for your printer – if your printer is not specifically listed in the program or manual, don't take any one's word that it will work: try it yourself, even if you make your purchase of the program contingent on its working with your printer.

Windows: If the program has windows, open as many as you can. Can you move from window to window, editing as you go, or can you only work in one window and just view the data in the others? Try copying part of a spreadsheet from one window to another. Is it possible to use data from one spreadsheet in a calculation in a second?

Graphics: If the program has graphics, try creating several types of graphs from your sample spreadsheet and printing them out (or setting them up for print out). Can the axes of the graph be rotated, stretched and compressed? How easy is it to change the labels on the graph and add text? What choice of fonts are there? Can points on the graph be labeled? Can colours be customised? Are graphs automatically redrawn as the related data is changed?

Recalculations: How easy is it change a formula and then recalculate the spreadsheet? A large file with complex, related formulas is needed to properly check recalculation speed – ask the dealer if they have a sample file. Does the program only recalculate changed formula, or does it waste time reworking the entire spreadsheet? Note the size and complexity of the recalculation, as well as the time, so it can be compared with other programs.

Features: Try a range of the other features the program offers – are there any that would be especially useful for the work you have in mind? How easy is it to insert, delete and copy individual cells, rows and columns within the spreadsheet *and* between different spreadsheets? How easy is it to define and invoke macros? Can you manipulate a specified range of cells covering a number of rows and columns? Can a number of cells (not necessarily in the same row or column) be averaged, or otherwise manipulated easily? Is the documentation useful for applying any advanced features the program may have, or does it just explain the basic commands? How easy is it to transfer data to and from other programs such as dBase and Lotus 1-2-3? Is the spreadsheet compatible with other applications you're running, especially your word processor? Will your computer system require extra memory or other enhancements to use the program. If you only have a floppy drive system, make sure you see the program run on floppies only – you may find a hard disk is essential if your spreadsheets are likely to run to more than a screenful of data.

columns should change and some shouldn't.

Borland makes a lot of one of Lotus' main shortcomings: the fact that it doesn't warn you if you have made changes and not saved your work. Quattro prompts you only if you have made changes, so you are more likely to take notice of its warning. This may seem like a small point, but it illustrates the professional approach of Borland. It also has a practical application for me because I often leave the one spreadsheet on the screen all day long, and it's useful to know whether there's been any changes since the last save.

Then there's 'intelligent recalc', which should be made a standard spreadsheet function. Quattro recalculates only those formulas that have been changed, whereas most spreadsheet programs recalculate all formulas in the spreadsheet whenever a change is made. One of the big pluses for Quattro is the graphics. They are completely integrated with the main program, and offer a choice of ten kinds of graphs: line, bar, XY, stacked bar-

,pie, 3-dimensional bar, area, rotated bar, markers, and combined lines and markers. If you don't select a graph type, Quattro automatically prepares a bar graph. The graphs are of presentation quality and are quite attractive, especially the 3-D and area graphs. The options available should be more than enough for most people. Named graphs are stored with the spreadsheet, and if you change the spreadsheet data, the graph reflects the changes the next time you display it.

A macro is a recorded sequence of keystrokes and commands that can be invoked with a simple command. In 1-2-3 you use the Alt key in conjunction with one of the alphabet keys to execute the macro; in Quattro you can use the Alt key *and* the Macro Execute command /ME (or F88) to let you execute an unlimited number of macros. To create a macro you can type keystrokes in a cell and assign a block name to the cell. Alternatively, you can use Macro Record mode, in which Quattro records each step you take and stores it in part of the spreadsheet.

To use macros created with 1-2-3 in Quattro, you must load the Lotus Menu Tree. Provided you stay clear of the extra macro functions in Quattro, you can use Quattro macros in 1-2-3.

Product Details

Product: Quattro
From: Tech Pacific,
Unit 1, City South Business
Park,Epsom Rd, Rosebery NSW 2018
(02) 697 7111
Price: $360

SQZ!

AS A BONUS, Quattro throws in the program SQZ! which compresses (squeezes) spreadsheets so they take-up less disk space. My sample file took-up 108,347 bytes in its normal form; saving it with SQZ! reduced this to 30,739 bytes.

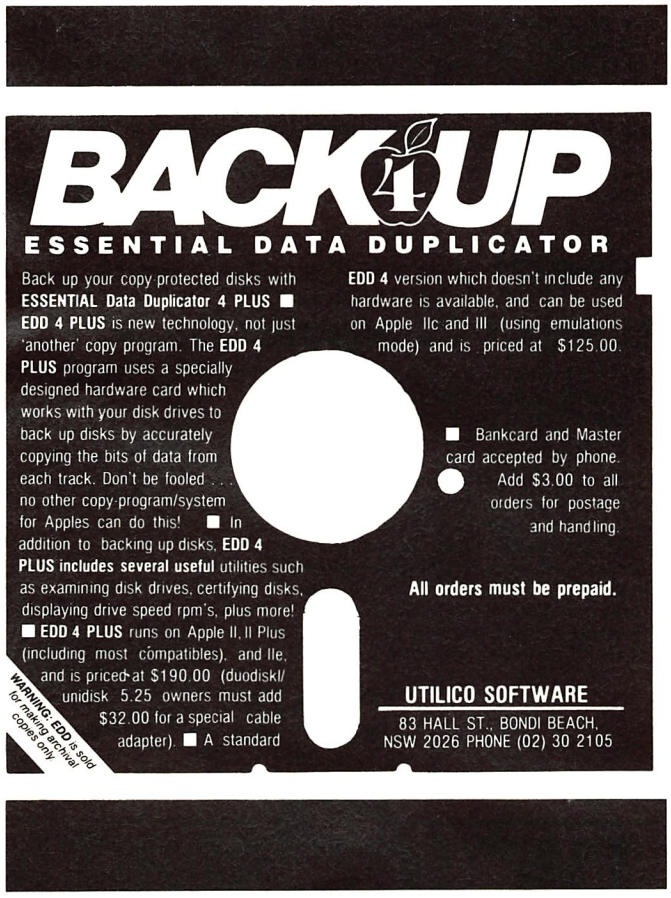
Borland claims faster speed than Lotus, and produce some comparisons to justify their claims: Recalc 0.27 sec *vs* 2.90; delete 0.76 *vs* 2.38; load 15.9 *vs* 19.8; and page down 12.2 *vs* 17.4. While I didn't use a stopwatch to verify these comparisons,it soon became evident when working with Quattro that it is much faster than Lotus in many functions.

It would be possible to go on and on about Quattro – about such things as the 99 @ functions, the ability to rewrite menus, the Single-Step Debugging Environment for macros and so forth, but I think you get the message.

Quattro runs on IBM PCs and PS/2s, Compaq and other '100 per cent compatibles'. It runs under PC-DOS and MS-DOS, versions 2.0 and higher. You need 512K memory and either two floppies or a hard disk. It will run to 8192 rows and 256 columns, memory permitting. Expanded memory cards such as the AST RAMpage and the Intel Above Board are supported.

Summary

BORLAND'S Quattro has all the features of Lotus 1-2-3 Release 2.01 and-can imitate Lotus' mode of operation and commands, so Lotus users can use it without retraining. It also offers additional features, including integrated, presentation-quality graphics and a more elegant user interface. □



ImageWriter LQ Upgrade

Apple Computer Australia Pty Ltd will upgrade, free of charge, Apple ImageWriter LQ printers exhibiting printing symptoms at the top or bottom of pages or excessive noise during printing.

The upgrade is available to owners who purchased an ImageWriter LQ between August 11, 1987 and March 7, 1989, with a serial number which is less than Z483800251 and whose printers exhibit the symptoms outlined above. Apple wishes to emphasise that not every printer will have these problems and therefore not every ImageWriter LQ will require this upgrade.

Only authorised Apple Reseller Service Centres can install the upgrade. To minimise any possible inconvenience, customers are urged to contact their local Apple reseller to book their machine in for the upgrade.

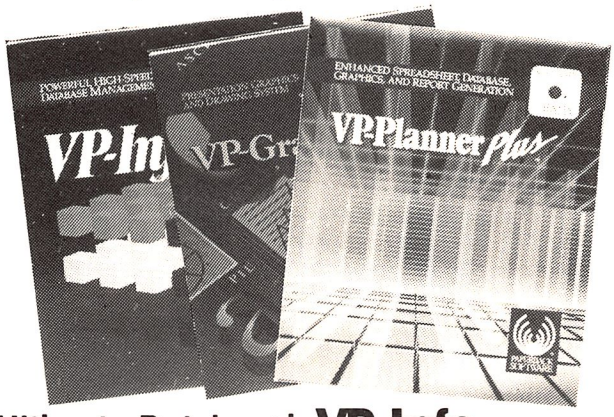
Apple provides a warranty of 90 days on this upgrade from the date of installation. This upgrade must be installed by an Apple Authorised Service Centre for this warranty to be valid.

This offer will remain in force until 20th October, 1989. Acceptability of the printers for the upgrade will be at the sole discretion of Apple and its Authorised Apple Reseller Service Centres. This offer does not extend to printers which have been altered (including defacing or altering a serial number) or modified by unauthorised third parties, such alterations or modifications in Apple's opinion making the printer unacceptable for upgrade.

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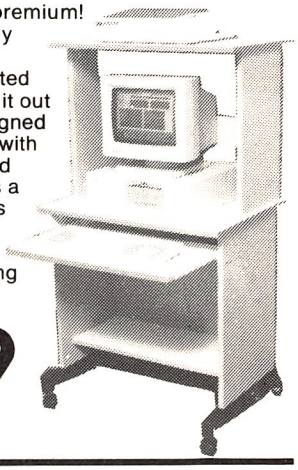
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Cat X- 2036

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Turbo Comms

for remote comms

If you need to access remote machines, either mainframes or a network, this Australian package could be just what you need. And, as Steve Keen reports, you can forget all that 'protocol' guff!

THE PIECE OF computer equipment that I most loathe is that piece of wire called the serial cable. Ostensibly intended to facilitate communications between computers, its practical role seems to be to frustrate them. To talk to a 'dumb' device you need a direct-connect cable, while talking to an 'intelligent' one requires a crossover cable (pin 2 at one end connected to pin 3 at the other). Some machines require hardware handshaking, others don't; and on it goes.

Traditionally, communications software has echoed this hardware complexity. Not only have users had to know about bits per character, parity, stop bits and flow controls, they have also had to learn complicated commands to vary the necessary settings. An Australian company, ABC computers, has produced a Turbo Comms which breaks this complex mould, as well as providing high-speed communications and the extremely useful ability to run a remote machine – making it invaluable in user support. It is memory resident, and capable of communicating in the background without user intervention.

Once loaded, Turbo Comms returns control to DOS. It can be invoked while running any text-based program by holding the Alt key and pressing the spacebar – a combination which is unlikely to conflict with any other programs. It will not take over from a graphics program, but beeps and pops-up when you exit back to DOS.

From then on, it's run by pop-up menus controlled by function keys, with full text explanations for each option. For example, the main menu F1 is Connect Services – choosing it calls the a sub-menu where F1 selects 'Change configuration of Port' where pressing F1 toggles the baud rate from 300 to 115K baud, F2 toggles data bits and parity, and so on.

You return to your earlier program at any stage by pressing Alt-spacebar again, enabling rapid transfers between communications and other work. The main menu also offers an 'Exit and remove from memory' option.

Product Details

Product: Turbo Comms
Distributor: ABC Computers
113 Parramatta Rd,
Camperdown 2050 NSW
(02) 519 9922
Price: $380

Features

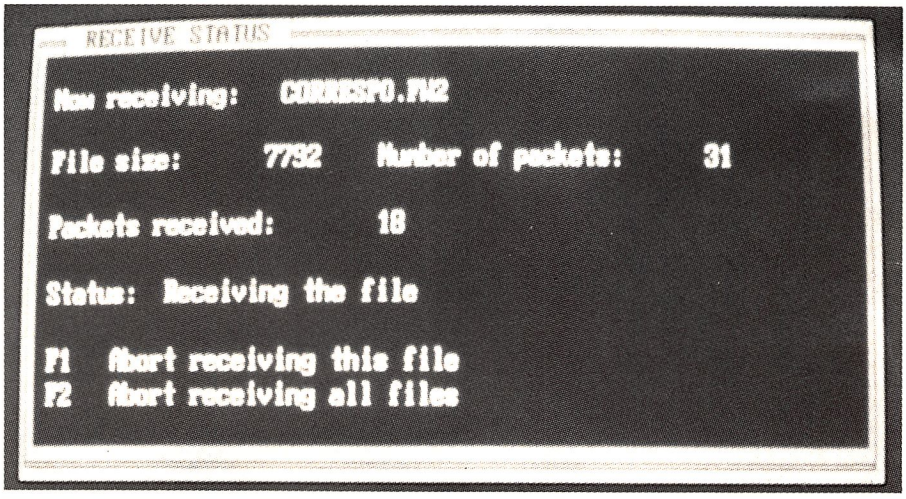
TURBO Comms has a touch of copy protection – each copy has a serial number, and communications can only be established between copies with different serial numbers. With AT computers and a direct connection, Turbo Comms easily achieves communication speeds of 54 kilobaud (about 5000 characters a second), making it ideal for file transfers. it backs up this speed with a proprietary 'sliding window' protocol, which is superior to many other protocols in guaranteeing that what the sending machine transmits is actually what the receiver gets.

Modem connections result in similar speeds to other packages, but here design still sets Turbo Comms apart. The program begins in Chat mode (similar to the old Perterm) with Send and Receive screens: the two operators can hold a conversation simply by typing.

The main appeal of Turbo Comms is its ability to run the remote machine as if you were typing commands at its keyboard. This extends as far as being able to run a network, or a 3270 emulation board to access a mainframe. The advantages of this in software support are obvious. If the user has crashed a program, or got themselves stuck, an experienced user can take over the program and recover the situation. The novice then sees the relevant commands executed on their machine – and can still send commands, if necessary.

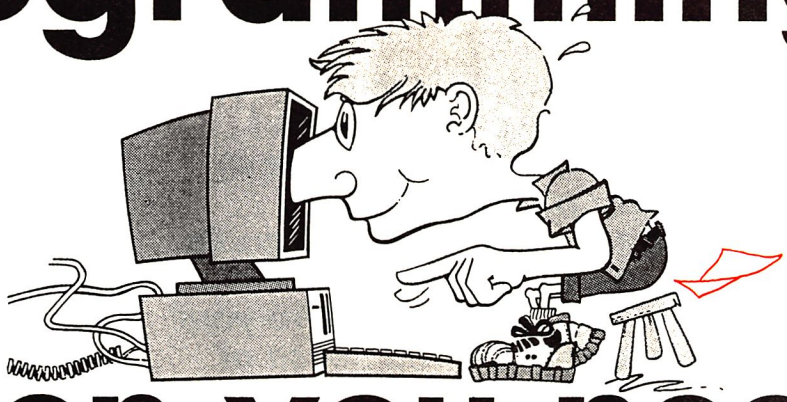
Turbo Comms gives you function key access a limitless number of remote services. When the program is set-up, you have the option of installing dial-up numbers, including an up to 30-character name, number, speed, databits and parity. When running Turbo Comms, the first ten of these can be accessed simply by pressing a function key. For additional services, you press the Page Down key; the other services scroll into view, and are now function key accessible. It also provides VT100 emulation, with Kermit col built-in.

Turbo Comms is a well-designed, bullet-proof package with considerable appeal to software support staff and professionals who frequently need to access a network or mainframe from a remote location. □



Turbo Comm is an Australian produced TSR communications program that can be used to operate remote mainframe or pc.

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ON THE AGENDA!

None of Lotus' post-1-2-3 offerings – Symphony, Jazz for the Mac, Manuscript and GraphWriter – have set the market on fire. But, as Steve Keen found, this text-orientated database may yet rekindle some excitement.

AGENDA IS A departure for Lotus. Every previous product, 1-2-3 included, was an entry into an already established market – spreadsheets, integrated packages, graphics. 1-2-3 was the first cab off the rank on the IBM PC, which is why the company sprang to prominence. The packages after Lotus were come-latelies in their own markets, and were not good enough to displace the established market leaders.

Agenda, however, is an entry into a market which is still wide open: text-orientated databases, and analytic ones at that. Its only competition here are Superfile and AskSam, and its approach is radically different to either of those programs.

Agenda works like a combination of a word processor's outlining feature, and a

MICHAEL TCHEREVKOFF/THE IMAGE BANK

relational database. Essentially, it is a project management tool for non-engineers (though engineers could doubtless make use of it, even without Gantt charts).

All business projects, from selling someone a photocopier, through speculating on the money market, to establishing a restaurant, can be broken down into a series of steps which can be categorised under different headings. However, the process of arriving at a business plan can involve random inspirations, hunches which are worth checking out, leads that may or may not be productive, etc.

Most project management tools can cope with the first approach to a business plan; free-form databases like Memory Mate and AskSam (the former was reviewed in our July 1988 issue and the latter in August 1988) can cope with the second. Agenda can cope with both (though there are some things it can't do which the last two can.)

Menus

THE TOP of screen menu is activated with F10; from then on it behaves like a Lotus menu, with a top line of choices selected by pointing or pressing the first letter, and a second line explaining what the sub-options are. I would be pleased to see Lotus move over to the majority approach of pop-down windows (with their inherently more informative menu options), but so long as it is in the courts defending its user-interface, that is unlikely to happen.

There is no function key template: the bottom two lines of the screen are devoted to that function, giving you up to a seven-character description of the function of each key. There are Alt-Function key combinations, and when you hold down the Alt key the display automatically changes over. There are other interface improvements, in file handling (moving around subdirectories is a breeze), selection of options (pop-up menus are used for such things as selecting printers; these use either the space bar to toggle through options, or the numeric plus key to select from another pop-up menu), which makes Agenda's interface a considerable step up from 1-2-3.

The remainder of the screen shows either Views, Sections and Items (and Notes), or Categories.

Database

VIEWS ARE selective perspectives on your database: one view, for example, could show only things that have to be done today, another could show tasks in order of priority, and so on. Items are the records in an Agenda database, and they can be up to 350 characters long. Notes are longer comments (up to 10K) – they can also be structured and employed in the program.

Categories are headings under which items are organised. Items can be entered without initially being allocated to a category, in which case they go in under MAIN, the default. Categories are structured, so for example you could have a Contacts category, with sub-categories beneath that for each person. They correspond to the directory and sub-directory structure of DOS.

Product Details

Product: Lotus Agenda
Distributor: Imagineering
77 Dunning Ave,
Rosebery 2018 NSW
(02) 697 8666
Price: $675

'Agenda works like a combination of a word processor's outlining feature, and a relational database. Essentially, it is a project management tool for non-engineers (though engineers could doubtless make use of it, even without Gantt charts).'

On the Agenda

YOU CAN approach Agenda in either of two ways. The easier is to simply start typing ideas into a blank database. Agenda then stores each idea as an item, and if you make an interpretable date reference (like 'Ring Kathleen each day to get messages', or 'Send out leaflets by next Friday') it automatically attaches a 'When' date to the item.

Or you can set-up categories such as appointments and contacts, and then start entering items. Categories can be organised hierarchically, so Kathleen would come under Contacts, while BHP would come under Companies (sub-categories can go up to 12 levels deep).

Agenda will scour the text of each item, and automatically assign items to the mentioned categories. Then whenever a text item used Kathleen's name, it would be assigned to her category. The same text item could refer to several different categories and it would automatically be assigned to each of them by Agenda.

Many of your items will contain text references which can be cross-referenced – for example, Kathleen may run a company called BizWiz; she may also be the person who handles your invoices. Agenda can be instructed to cross-reference an item concerning Kathleen to both BizWiz and Invoices, once you set them up as Categories, and specify relationships between them using the Action and Condition commands.

An action means that if the item refers to the category Kathleen, it also refers to the categories Invoices and BizWiz. A condition means that if you mention Invoices or BizWiz in an item, also cross-reference it to Kathleen.

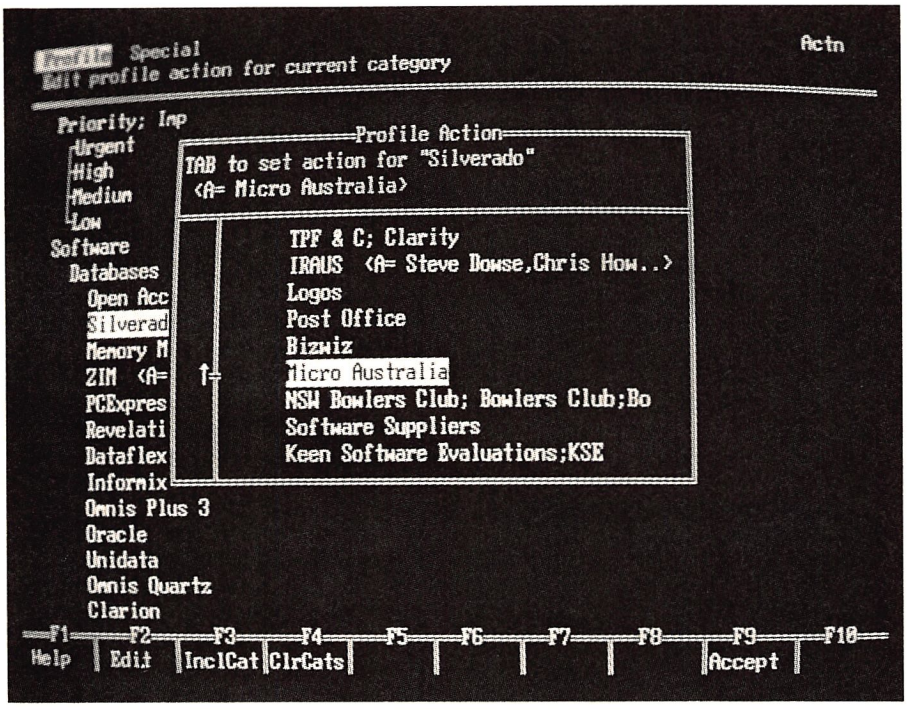
Finally, you can assign an item to a category manually, by creating a column to display a category, and making an entry in that column next to an item. The advantage of the automatic method over the manual is that, if at a later date you detail your invoicing to another company, all you have to do is change the Action assignment. If you had directly entered that all items with Kathleen's name in them referred to Invoices, you would have to go through and manually remove the reference from each.

Agenda's time handling takes care of Entry and Done dates, as well as When dates. The Done date function lets you keep track of a project as each item is completed, and you can even save done tasks in a special file. Agenda dynamically resets some date references, so the reminder 'tennis every Saturday at five pm' will pop-up on your reminders view every week.

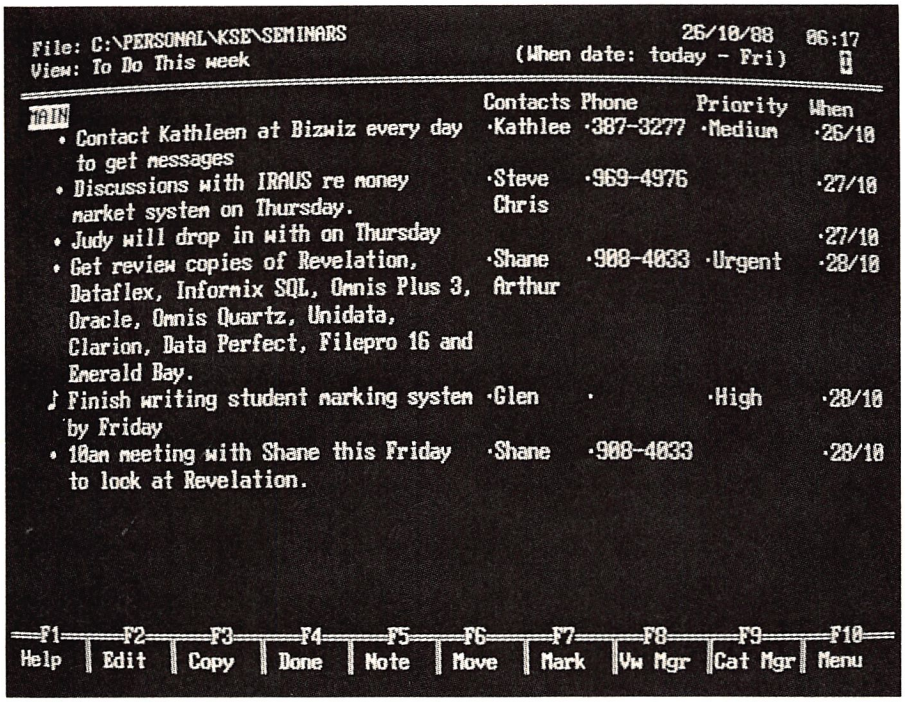
Organising Views

To manage all this information, you need different views – one could show you everything you have to do in date and priority order, another could show your appointments for the week, another your tasks under a particular heading, another your dealings with different contacts, etc. Agenda dynamically manages this information as time progresses and tasks are completed, allocated to different people, or neglected – in which case they will remain obviously undone, unlike the normal situation in business.

The essence of a view is the display of tasks – 'Call in to the Bank tomorrow to establish the cheque accounts for KSE' – under relevant category headings, in a nominated order. A 'To Do' view could



Lotus Agenda is an entry into a market which is still wide open: text-orientated databases, and analytic ones at that. It also provides the essential features of a project management package.



Agenda uses Views as selective perspectives on your database: one view, for example, could show only things that have to be done today, another could show tasks in order of priority, and so on. Notes are used as longer comments – they can also be structured and employed in the program.

show all items, regardless of categories, in date order. A finances view would only show those records pertaining to finances, and so on. As well as displaying the bare item, Agenda can display associated information from other categories in columns, next to each item. With the above example, you could have a contacts column and a telephone column in the view. If your contact at the Bank was Michael Matthews, the Contacts column would show his name, while the Telephone column would show his number. Each view thus gives you a particular perspective on your project. Like a true relational database, changes to an item in any one view are reflected in any other view.

Like a true relational database, changes to an item in any one view are reflected in any other view.

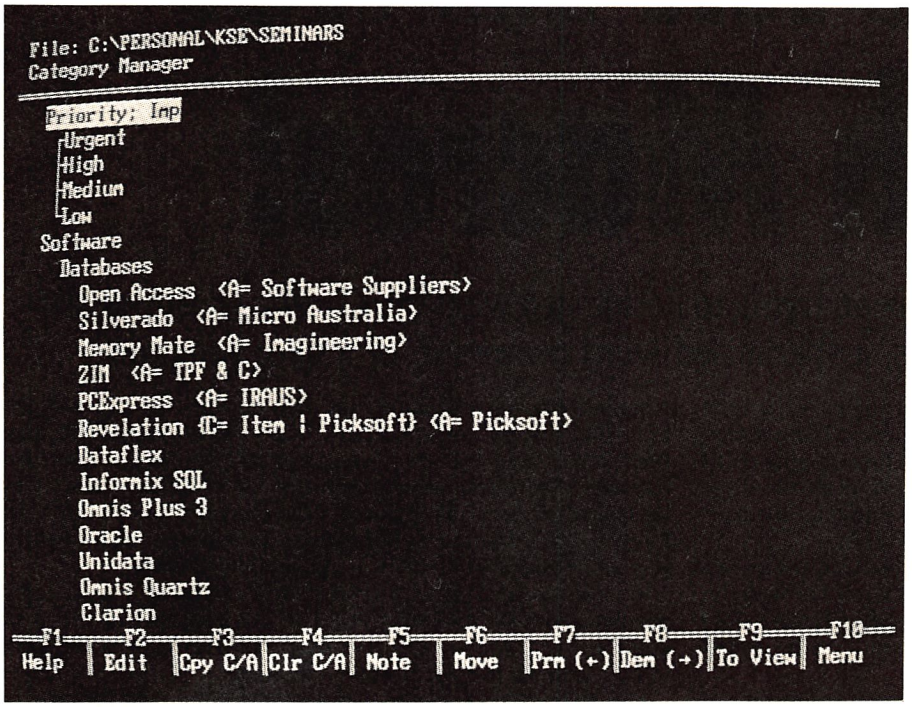
Documentation and Help

TYPICALLY, I find that Lotus' tutorial manuals are good, their reference manuals a bit obscure, and their help systems very poorly indexed (you never seem to be able to find the item you want explained). Agenda's manuals and help system live up to that usual Lotus standard.

Thus, while mastering the basics of Agenda is easy, the finer points take work, partly because the program is complex, but partly also because of the language used to describe its operations. For example, categories are structured into parent (top level) and child (lower level) categories – in itself that's easy enough to follow, but the manual tends to be obscure in its explanations:

An Ancestor column displays an ancestor of the category to which the adjacent item is assigned. Specifically, it displays the ancestor that is also the child of the category displayed as the column head.

Similar problems arise in the explanation of Conditions and Actions in the category manager. I worked out how to use Actions to advantage easily enough, but it took some time to decipher the role of Conditions – the discussion is altogether too rambling and complex.



Categories are headings under which items are organised. They are structured, so for example, you could have a Contacts category, with sub-categories beneath that, up to 12 levels deep.

Agenda is not designed to take entries from unstructured text files; nor is it ready to directly import dBase or similar files. Its stock in trade is a structured text file, where each set of lines refers to a particular category, or where items can be imported and categorised.

Probably the best way to convert a typical dBase application to Agenda would be to perform a join between the related databases, and generate a report with one field per line, with a particular line devoted to categories. While not straightforward, the process of designing a macro to perform the import operation is reasonably well described in the manual.

In summary. . .

PERHAPS the major deficiency is that Agenda lets you edit a Category entry, but doesn't automatically update note and item references to that category. Let's say one of your Contacts had changed her name after a divorce. If you change her name under category management, you would still be left with items and notes referring to her old name, and, thus, lose those items from your organised database, unless you go through and replace each entry manually.

Agenda is also colour-blind. A sensible, limited use of colour could enhance its use greatly – for example, letting you assign colours to exclusive sub-categories of one category, such as priority. Urgent items could then be shown in red, medium priority in blue, low in green, and so on. I would also like to see a 'spell check' facility which could look through an item or piece of text, check each unknown word, and ask whether you wanted to make it a Category. However, that kind of development is a wish-list number – maybe we'll see something like it in version 2.

For a first release, Agenda has a high degree of finish. For example, it is configured to support both the international and US character set. While it isn't the way to store all your phone contacts (that's best left to Memory Mate), and AskSam might still beat it for organising a bibliography, there are many text-based applications where it can't be beaten.

It provides the essential features of project management, in a fashion which is applicable to a far wider community than would generally use such software, and in a manner that is far easier to use than most project management tools. With Agenda, Lotus have finally brought out a worthy cousin to 1-2-3. □

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A QUick EDitor with Macros!

For months, Stewart Fist has been trying to decide just what QUED/M is – a super text editor for programmers, a specialised word processor, or a fix-it program?

I'VE PUT OFF writing this review for quite a number of months now. Every time I sit down with this program, I find something new and end up spending so much time playing that I never get around to writing. This is both praise for the sheer brilliance and utility of the program, and damnation for the paucity of the manual and the nonexistence of a tutorial.

The program is QUED/M from Paragon Concepts, written by Victor Romano back in 1985. Paragon are up to version 2.07 with the copy I have, and they are about to release a modified (more word processing orientated) version in a few months, to be called Nisus.

The first thing, obviously, is to tell you what sort of program it is – but that is not as easy as it may seem! The best I can do is to say that it is a super text-editor for programmers, and/or a specialised word processor, and/or a fix-it program for databases, or for text files, or communications, or whatever.

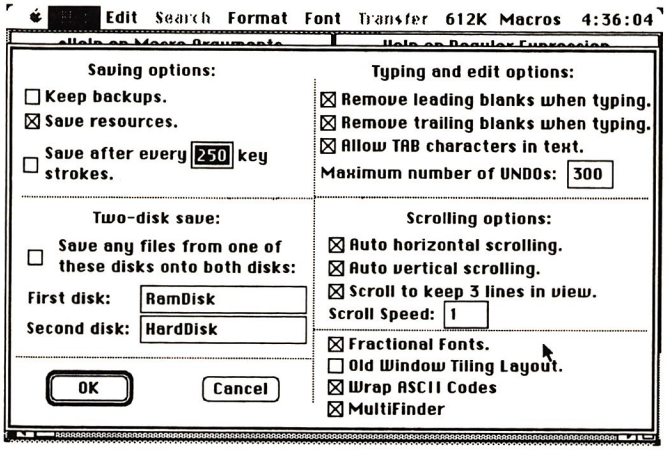
You name it – if it has something to do with text and data, QUED/M probably does it, and does it well, provided you are willing to take the time setting it up. What the program isn't, is actually easier to categorise. It isn't a Microsoft Word, or a FullWrite Professional. At best, for word processing, it is only the text-entry half of the old MacWrite.

Given the hundreds of standardised W/P programs floating around at present, this is the word processor for 'the rest of us' – meaning those relatively few homo sapiens who don't just type letters or reports, print them and mail them off.

You'll be interested in QUED/M if your work emphasises the 'content' side of text, databases or programming – as distinct from the 'display' or 'appearance' side (layout, formatting and the like). If your job involves computer communications, file transfers, desktop publishing, programming in dBase (or any similar language), checking multiple-author reports, sub-editing text for typesetting, translating data between databases/text files, then you would probably use this program fairly regularly.

You will need it especially when you are up against a copy deadline, and you're tearing your hair out because everything is going wrong. If you are a serious user of words, this is a program to buy, learn to use, and to have on hand.

You might also choose to use it as your basic word processor, just to get the words in. You can always format it and pretty it up later. QUED/M works well down at this base level – and it has very powerful ways of searching for specific text, finding words or control characters, and of changing some while ignoring others.



QUED/M's File menu preferences give a wide range of controls over the program at start-up.

Unix-like macros

JUST AS dBase and most other database management programs have a procedural language which let you automate very complex selection, change and manipulation processes with databases, so this program has a special Unix-like macro language which lets you select, change and manipulate characters in text and data files. It can do this at the printed-character level, or with programmers' hex representations of the characters.

The accompanying box item should start to give you a taste of what QUED/M can do – but the potential range of this program is as wide as your imagination. Let's look at it in three different ways it is used. First, as a word processor.

The program has got relatively standard File and Edit menus, with a lot of extras thrown in. Using the File menu and the dialog box, you can open any number of files up to the limit of your memory, and the files can be of any size – again, to the limit of memory.

Up to 16 files, QUED/M will open them in the normal 'stacked' window style, laying one over the other with a slight horizontal and vertical displacement so that you can see the others behind. Over 16 files (or if you choose from the menu) the program will open them in 'tiled' format, each in their own little window box, side by side, and one line of tiles above the other.

You can alternate between these different window treatments at any time with just one menu click – or a double click on the top 'file-name' bar. And in the tiled window you can expand your active window to full-size with the conventional zoom box. When you change from one active window to another, QUED/M keeps track of the old cursor positions by leaving a 'dead' (non-blinking) cursor at the point of departure, so if you go back, you return to

The ultimate in text editors

QUITE OBVIOUSLY this program was originally designed by a hacker who wanted the ultimate in text editors. I don't know Victor Romano, the author, but I'd bet that he spends most of his leisure time deciphering source code. Hackers dream about a word processor like this because it enables them to find and manipulate the data, and fortunately the more sane of us need processors with this power to find and correct problems. So there's a mutuality of interest here.

Let's look at some examples of how QUED/M might be used by non-programmers –

- I've written a long, indexed document in Microsoft Word which I've translated to a Text file, and I now find it cluttered with the indexing control characters. QUED/M will zip through the file and remove them almost instantly and very accurately. You can automate the procedure with a high degree of precision and set it up as a macro which will clean up any number of selected files (active or inactive) at any time in the future.
- I've got a number of text files written by a very buggy beta-test version of a popular word processor that was loaned to me for pre-release evaluation. I now don't have the application, and none of my conventional word processing programs will open the files – but QUED/M will. And, it will often open conventional word processing files that have been partly corrupted, even when their own applications won't work.
- I need to send off a report for checking by the Perth office, but my printing deadline is only hours away. I simply select the Line Numbers option from the Format menu, print out the document and fax it to them. When they phone back with corrections, I can quickly and easily find each change using the line numbers, make the modifications on the keyboard, then remove the numbering with one click of the mouse.
- I have a first-draft report that four different State Managers will need to check – and I know that each of them will make many minor finicky alterations. I make four disk copies and send them off. When they come back I simply run QUED/M with the master copy in the left window and each modified copy in the right, and click on the Compare menu selection. It runs through both until it finds discrepancies. This gets a bit tedious if there are dozens of changes, so I can quickly construct a macro to semi-automate the process, while still giving me the option to accept or reject every change.
- I've just imported a weird and wonderful database file from some exotic mainframe program, and I want to re-format it for FileMaker II. First of all, QUED/M lets me inspect the file to see what control characters have been used for field and record delimitation. I can then automate a search-and-replace macro to convert the file to the new format, no matter how exotic the formatting sequences are.

That should give a taste of the power and flexibility of the program – I'm sure you can now see ways you could use it yourself, if you are a 'serious' user of words.

the same position in the file. It does this with any number of windows.

The File menu has the normal Cut, Paste, Copy, Clear and Select All, but in addition it has Move Right, Move Left (which jump the selected copy one tab stop), Upcase, Lowcase and Change Case (which swap between upper and lower case), and Capitalise (which caps the initial letter on each word in a selection).

There are also ten different clipboards and you can treat each clipboard as if it were a separate file. For instance, you can print-out a selection from within it, and you can progressively add data to that already in a clipboard. As you run through a series of files, you can progressively build on to material in one or more of the clipboards. This is one of the handiest features in the package.

Undo is on the File menu, too, but in QUED/M you can undo the last 300 changes, not just the last one. Even if you've completely stuffed-up a sub-editing job, you can still recover by stepping back through the undos until you get to where you want to be.

At this point I should also mention that you can preset Options as a sub-set of the File menu and these options can include things like automatically saving the file every 250 keystrokes, or double-saving your files both onto the hard-disk and onto a backup floppy at the same time. There are a lot of other minor features here also.

The program's limitations as a word processor are in formatting and flexibility. You don't have rulers, but you can Set Line Width from the Format menu, and tabs can be established every 'x' characters along that line. You've got the full choice of fonts but you can only use one in each document, and only at one size. The likes of Bold, Outline and italics just don't exist, so at this level the program is for text entry only.

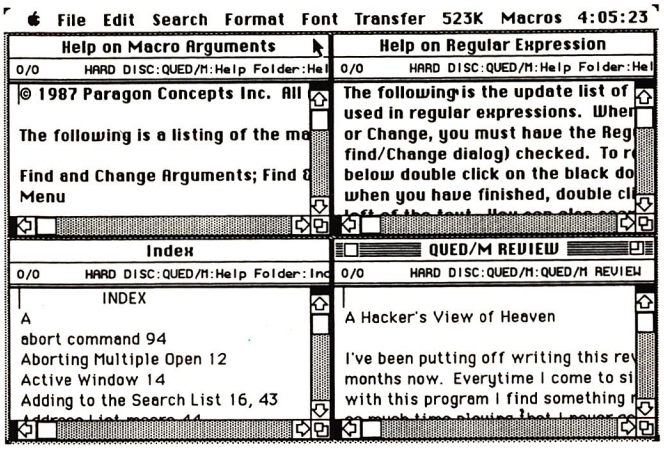
A sub-editor's friend

THE SECOND way to look at the program is as a sub-editor's friend. Here we are mainly concentrating on its search and replace functions – unfortunately QUED/M doesn't come with a spelling checker, thesaurus or hyphenation dictionary (maybe in the next version).

Procedures can be directed to only the one active file, to selected open files, or to files still closed on the disk. You can create a macro of file-names and file-paths to search, if this is a repeated problem. These search and replace functions will all work either under menu selections, or under macros written in the Unix Regular Expression Language.

So you can set this up a bit like Gofer, to scurry around your hard-disk looking for a reference, then extracting those paragraphs that match and bringing them back to some file. It is hard to see where macros of this complexity differ from object-orientated procedural languages.

QUED/M also has hidden markers that can be set at any place in your text you choose Set Marker and provide it with any identifying character/s, and this marker selection is then automatically added to the bottom of the Search menu. You can use letters,



There can be any reasonable number of Tiled windows; each can be instantly expanded to full size with a single click.

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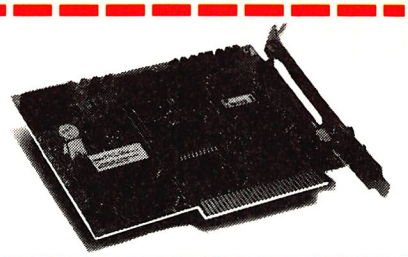
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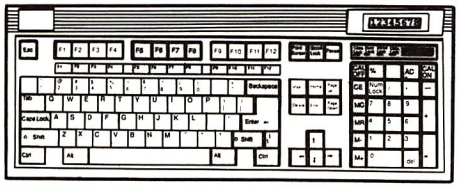
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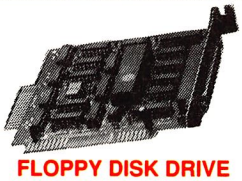


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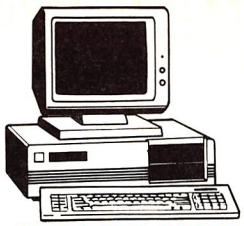
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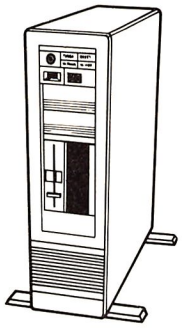
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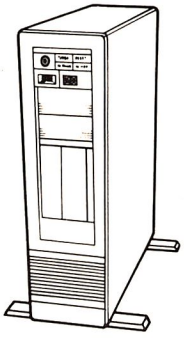


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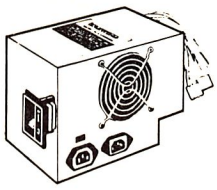
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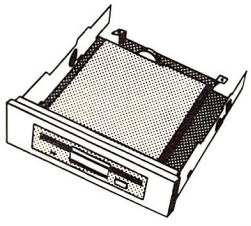
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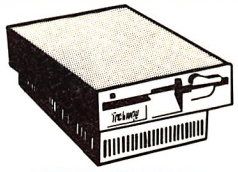


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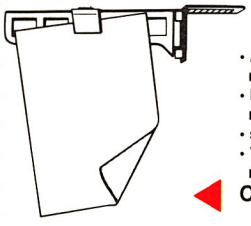
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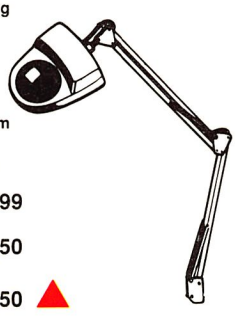


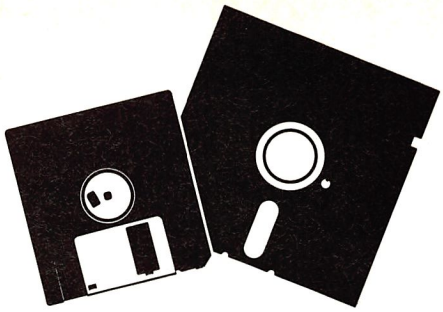
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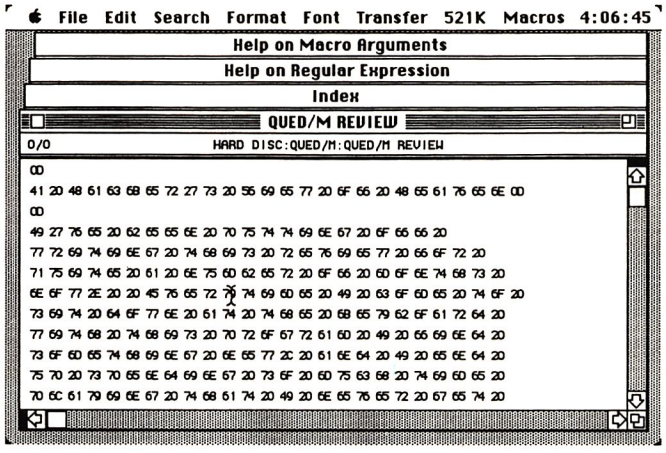
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ROD IRVING ELECTRONICS

numbers, or words and have up to fifty markers at a time, but this number will push the menu off the bottom of the screen.

When you want to jump to one of these preset points, you pull down the menu and click on the marker you want. I have found this facility so useful that it has made QUED/M my favourite writing tool. In effect it allows me to synthesise an ideas processor: I simply write down all my headings and mark each one; then, as I write, I can instantly jump back to any heading and add material into the copy before the marker, thus keeping the marker at the



The Stacked window option slightly offsets each window to allow you room to point and click.

end of every sub-section.

There's a special Hypertext-type function here also; it's identical to the Replacement button in OWL's Guide and the way most outliners work. If you select a paragraph of text with a heading as its first line, then choose Hide Text from the Format menu, all the lower lines will collapse and disappear, while the heading will be outlined by a fine line box. If you double click now on this heading, the paragraph instantly unfolds again.

There's a special NIL marker (set by a Carriage Return) that lets you toggle-jump between your current position in the text, and the preset NIL position. One click takes you back, the next brings you forward, and the next takes you back again; it is instantaneous over very large files.

Virtually all of the menu selections have Command-key equivalents, and this also applies to customised items on the menu, like the NIL marker which only becomes a menu item when you set it. To toggle between the NIL marker and your previous position, you can also use the Option-tilde key which makes the process extremely fast and simple.

There are a whole range of strange and unusual operations you can perform on text files with this program also. Here are five examples –

☐ You can change a tabbed layout to columns separated by spaces, or vice versa.

☐ You can check for pairs of brackets, quotes, whatever, and also reject accidental pairs of words like 'the the' in the middle of a sentence.

☐ If you want, you can sort paragraphs or lines of text with the order based on the first alphanumeric in the line. And you can undo the sort if you don't like the result.

Product Details

Product: QUED/M
Distributor: Trio Technology, 5/1 Mill St,
Perth WA 6000
(09) 321 4724
Price: $225

'You name it – if it has something to do with text and data, QUED/M probably does it, and does it well provided you are willing to take the time setting it up.'

Nisus, the full-featured word processing version of QUED/M is now available; it's priced at $495.

☐ You can synchronise files and run them forward and back on a character by character basis.

☐ You can count characters, words, sentences and paragraphs, and you can automatically create a directory/index of all the words used in an article or report.

There are hundreds more possibilities. Those last three are functions created by macros, so without further ado we better get in to this third side of the program.

Macros

QUED/M uses a Unix-like Regular Expression set as part of a procedural language, together with commands and some Macro Arguments. This all sounds quite frightening (it has to be admitted that no one approaches this aspect of the program without some trepidation), but it is here that the full power of the program becomes possible.

If you are familiar with HyperTalk, the object-orientated language behind HyperCard, then you might recognise how a string of commands can be grouped together to form a single sequence which can be called up, run to do something, and then stop. These are discrete program modules.

A good example of a macro is one to find any digit at the beginning of a line. It looks like this –

```
Find ":^:d" "g"
```

There are two main divisions to the macro: Find is a command, which is followed in this case by two 'arguments', each enclosed by double inverted commas. The first of these (":^:d") is a Regular Expression made up of two Meta Characters. The colon plus caret sign designates Beginning of Line, while the colon plus 'd' says Any Digit. The second argument ("g") is a Macro Argument which says Switch on the Regular Expression Mode. A macro might have dozens of lines some consisting of commands made up with these Regular Expressions, and others which use relatively straightforward English expressions like –

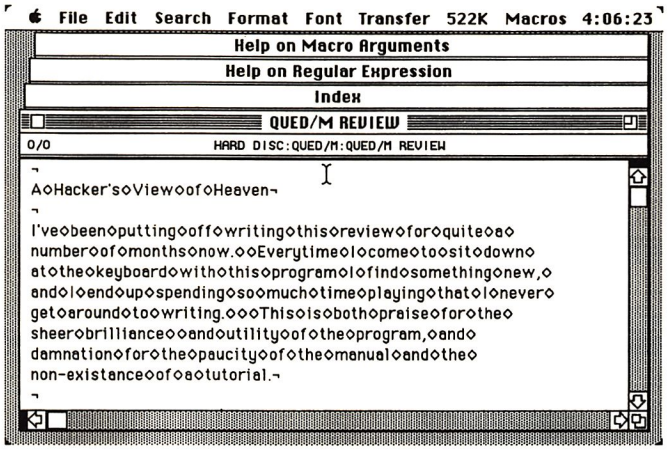
```
Open "Review Disk QUED/M Review"
```

QUED/M calls these macros, but when you think about it, it's hard to distinguish macros from object-orientated language modules – or either of these from procedural language command programs for, say, dBase.

Some macros look complex because they use these Meta Characters, which, in effect, are only shorthand. For instance, within a Regular Expression, ':e' means the end of the text and 'S' the end of a text line. If, in a search-and-replace macro, I were to

include the expression 'tion$', the macro would search for a word ending with 'tion', but it would only be found if it were at the end of a text line, because of the appended $ character.

There are about forty of these Meta Characters. Some refer to specific points in the text, others mean things like 'any lower case character', or 'any digit', or 'one or more space characters'. There's no simple way around this – you either learn all these Meta characters off by heart or you look them up each time you want to write a Regular Expression.



Files can be displayed in Hex format, an option that will be popular with programmers.

The program comes with an extensive file of macros which need to be loaded (using the File menu) before they will operate. When loaded, they can then be selected from the special Macro menu. You can add, delete, or change anything on this list by treating the macro file just as if it were any other text file or you can edit it *in situ* using the Edit Macro menu selection. You can also create your own complete macro file which will load on boot-up.

There are special reserved macro names that are used for special functions: to perform some activity automatically on load-up, for example, or if you revert to an early version of your file. These become the equivalent of batch files. And, macros can call other macros, so you can create quite extensive command strings.

There are numerous extra functions that can be added via macros because the macro process can use menus, and through a menu selection, it can activate functions in Desk Accessories. This means you can activate the Calculator and use it to perform mathematical functions or use the Find File DA to search for a file on the Hard Disk.

There are a couple of points about this remarkable program that shouldn't be missed. First of all, it has a manual written by hackers for hackers – Victor Romano obviously assumes everyone speaks computerese at birth and reads the Unix manual for light relief. But despite this, my fears about the likelihood of the program crashing were unfounded. It seems to be very well written and very stable, so you can use it without fear. Having 300 Undos makes it probably more risk-free than any other 'commercial' word processing program.

My other comments relate to speed. There's not much point in having all this functionality if the program churns along like an emaciated tortoise, but QUED/M is the rocket-propelled hare in this story. It fairly screams along. □

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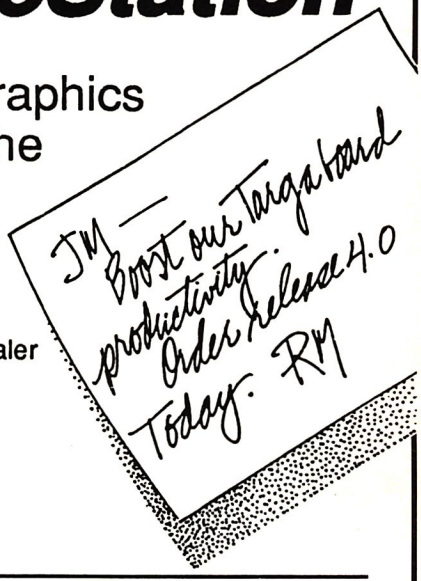
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Classroom favourites

IF YOU HAVE ventured into almost any classroom in the past two years, you would most certainly have seen the results of one or two Broderbund software programs. Where in the World is Carmen Sandiego? and Printshop are two of the most popular educational programs on the market which run on major educational computers including Apple, Macintosh, IBM PC (and Tandy compatibles) and Commodore.

They are inspiring programs, which we will have a closer look at in this feature, but first a word about the software distributor that now has the rights to distribute these and some 200 other titles from the Broderbund range – Dataflow. Over its five year evolution, the company has grown from its initial education market breakthrough with a popular lower-end desktop publishing program NewsRoom (published by Springboard), into success with other titles including Create with Garfield, the Explore-A-Story series and Maths Blaster. After two years of negotiation, the US-based Broderbund company realised the potential of Aussie Dataflow and a contract was signed for distribution of their software.

Not only will Dataflow be backing the tried and true favourites, it will also supply and support the whole Broderbund range. But, what about Carmen Sandiego?

This month, Sharon France reports on a successful classroom experiment based on Explore-A-Story and brings us on update on Carmen Sandiego's whereabouts.



Broderbund's perennial favourite, Where in the World is Carmen Sandiego, can be exploded into a number of classroom and curriculum activities – for example, students can be set a number of language arts activities such as creating police dossiers on further, yet unnamed, members of Carmen's Gang or writing newspaper reports on a robbery. Students could also form groups and more thoroughly investigate one of the countries mentioned in the adventure and make a presentation to the class, or write a supplementary description for the capital cities Carmen and her gang visit.

Where in the world. . .

CARMEN SANDIEGO is a former spy for the Intelligence Service of Monaco, who, according to her police dossier 'is a reported agent, double agent, triple agent and quadruple agent for so many countries that even she has forgotten which one she is working for'.

Where in the World is Carmen Sandiego contains a disk, a 20-page user's manual and a large paperback volume – the World Almanac and Book of Facts, making it a very open-ended package. At its core, it is an adventure game – you have to accumulate clues, single out the criminal, obtain a warrant, then track the villain down and make an arrest. The adventure is graphics-based, taking full advantage of colour (where available). As you fly from one country to another (your route is traced out on an on-screen world map) you are presented with a scene from each capital and a brief description of the country and city. Characters you meet by visiting local points of interest give you clues as to what the suspect said and where he/she may be headed. The sound incorporated in the program is delightful. The clacking of the Interpol typewriter as you register your name is spot-on and sets the mood for the adventure. You have received your orders – now down to business.

Carmen is unlike many of the earlier adventure games which worked entirely in an imagined world of castles, spells and laby-

rinths. The tool of this adventure is an everyday reference book which indexes and cross indexes everything from abbreviations to Zoroaster. Just from using the program and referencing the Almanac, students are introduced to world geography and titbits of cultural, social and economic information, which combine to give students a wider knowledge and appreciation of the world.

Beyond the basics, the program can be exploded into a number of classroom and curriculum activities – some computer-orientated, some not. Children can be set a number of language arts activities – creating police dossiers on further, yet unnamed, members of Carmen's Gang; writing newspaper reports on a robbery (expanding on how the crime was perpetrated, and where the journalist thought the criminals were heading for and why); and writing and conducting interviews with witnesses along the way. Students could also form groups and more thoroughly investigate one of the countries mentioned in the adventure and make a presentation to the class. Can the group write a supplementary description for the capital cities Carmen and her gang visit – briefly telling the sleuth of the temperature, what the terrain of the city is like and what sort of food the crime fighter can expect to find? Foreign currency is always a source of fascination for people of all ages. Students could be shown notes and coins from foreign countries and discuss why certain symbols are used (start with Australian coins and notes). For those currencies which are not obtainable, students could design their own, based on research into the country, and discuss their finished products with the class.

The possibilities for spill over into art and craft are innumerable. Students could create wanted posters for the criminals, masks based on the information in the police dossier for each member of the gang, models, paintings and maybe even sculptures of some of the stolen treasures (King Tut's mask, or Venetian Gondola). Flags of the countries mentioned in the program could be made to decorate the classroom walls.

Further use of computers may well be prompted by the mini database, which, in its mild mannered disguise as the Interpol Crime Computer, introduces students to the idea of classification and sorting. Students may go on to develop their own databases of criminals based on detective stories, comic strips and even television programs, entering their data into one of the 'empty' database programs (Bank Street Filer, Junior Filer and so on).

Education Updates

PLANNING FOR the 5th World Conference on Computers in Education is in full swing. Sydney will be hosting the conference in July 1990 at the Darling Harbour Convention Centre. Six major streams form the core of the conference:

- Informatics Education at the Secondary Level;
- Advanced Curriculum Projects in Information Processing;
- Research on Educational Applications of Information Technologies;
- Vocational Education and Training;
- Informatics in Elementary Education; and
- Distance Learning

Mini-conferences including a program called Kids and Classrooms 1990, and other activities (including an international commercial exhibition) ensure that the conference will have something for everyone – teachers, parents *and* students!

The Conference promises to be an exciting and important event for all computer education enthusiasts. A poster detailing conference events has been produced. For your copy and copy of the WCCE/90 newsletter, write to: PO Box 319, Darlinghurst, NSW 2010.

Bond invests in education

AS PART OF the Bond Endeavour Replica project, every secondary school around Australia will receive a gift of the software program Endeavour from the Bond Corporation. Originally released for the BBC range of micros earlier this year under the title Cook – A Discovery, the software will be available in BBC, Apple and IBM formats. From all reports, the package, including extensive teaching notes and student resources and activity cards, is most worthwhile. The program is in essence an interactive database published by Softime, Victoria.

Primary schools will receive a video study kit, also concerning Captain Cook and his voyage of discovery, based on the animated Kangaroo Creek Gang.

Perennial program

IT IS TRUE that Where in the World is Carmen Sandiego has been around for some time. But it is a perennial program with lots of open-ended avenues to explore. The program is well supported by Departments of Education in each state, which have in most cases, prepared teaching notes and ideas for curriculum development. Contact your state department of education for more information.

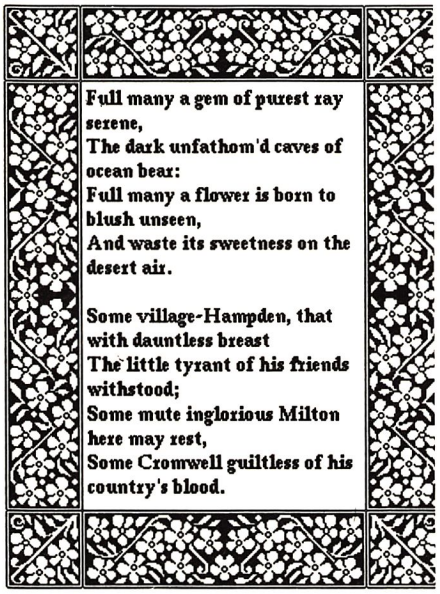
One comment I have about the program, which is a result of its origins, is that it is US orientated. This fact is neither good nor bad – just a bit distracting. The program itself does not draw attention to the fact, but the space allocated in the Almanac for national (US) events vs world events, American colleges and universities and data on US states indicates a decided bias.

The capers of Carmen and her gang have been extended to include Where in the USA is Carmen? and Where in Europe is Carmen?. The reference for the European edition is the Rand McNally Concise Atlas of Europe, which is a much smaller volume, and requires the sleuth to use more extensive map referencing skills. The information on towns and cities is much more concise, and probably better suited to the Primary classroom. This variation on the original theme includes extra features – a note pad facility and a gossip (another source of 'questionable' information). Where in the USA is Carmen Sandiego? centres on Fodor's USA – a travel guide, and is very American in content and application! If you are looking for a real challenge, this is probably for you.

Where in the World is Carmen Sandiego? is available for Apple (II+, IIe, IIc, IIGS), Macintosh (512, Plus, SE), IBM PC and Tandy Compatibles and Commodore (64/128). The Europe and USA versions are available on all of the above except for the Mac. School versions (includes back-up disk and Teacher's Guide – for $20 extra) are available for some machines.

Printshop

UNLIKE CARMEN (an interactive, problem solving adventure), PrintShop is simply a fun classroom tool which allows you to produce four different



By using PrintShop, students are encouraged to become aware of design elements. Naturally, first attempts at producing letterheads, banners, posters and greeting cards are overcrowded with graphics and often confused with too many type styles. Experimentation is the key and older students, especially, soon come to understand the need for simplicity and white space in their productions.

printed formats – greeting cards, signs, letterheads and banners. Like Carmen, PrintShop has been around for some time, being one of the precursors for classroom desktop publishing, and a much loved and used program for creating signs, cards and banners across all sections of the the curriculum.

You can tell from a glance the schools (and households for that matter) that have been bitten by the Printshop bug. Beautifully designed posters adorn the walls, and invitations to meetings, parties and school socials are now produced by students using the greeting card format, incorporating unique mixes of graphics and text. Banners are a favourite with teachers and students alike. They can be as long as you want and again allow the mixing of text and graphics. Printouts of these masterpieces can be decorated and then hung on the wall.

Students are encouraged, from using this software, to become aware of design elements. Naturally, first attempts at producing letterheads, banners, posters and greeting cards are overcrowded with graphics and often confused with too many type styles. Experimentation is the key and particularly the older students come to understand the need for simplicity and white space in their productions.

PrintShop easily fits into any Primary of Secondary classroom and integrates in whatever way the teacher sees fit, into the classroom activities and curriculum.

For some machines, there are a number of support programs which supplement PrintShop and its existing array of graphics. The Print Shop Companion (which includes a calendar maker, an advanced graphics editor, and other customising tools), and the Print Shop Graphics Libraries (there are three in all) open up new avenues of creativity. These complimentary programs are available for the Apple II series of computers, the IBM PC/Tandy compatibles and the Commodore 64/128 micros. Unfortunately, versions of these have not been written for the Mac, which does, however, run the main PrintShop program. Prices vary according to the computer system you have, but for around $80, it is a fun, useful tool for anyone's collection.

We had a hand in that!

AS WITH MOST sectors of the computing public, schools and their teachers are becoming more discerning about the software they buy. Today, there is a lot more to choose from and what most schools look for are software 'packages' – software producers can no longer get away with a shrink wrapped disk and indecipherable four-page blurb. Teachers do not have time to reinvent the wheel when teaching with a new piece of software, and require some teaching ideas and materials to make life a bit more bearable. Enter the 'educational software package' complete with disks, teacher's notes, student booklets and springboard ideas in a format that can be photocopied, adopted and adapted.

The Departments of Education around the country are doing a sterling job, developing teaching notes and strategies, and producing printed guides and notes. What is more encouraging is some software companies are taking this lead and using real live teachers to produce materials for these packages. Enter our case study – St Bernards of Berowra (on Sydney's northern fringe) and Dataflow. The software is the Explore-A-Story series.

Before we start, it must be said that Dataflow is not alone in its pursuit of school orientated and produced material of, by and for the teachers so to speak, however, it is interesting to talk to some teachers who have been involved in the process.

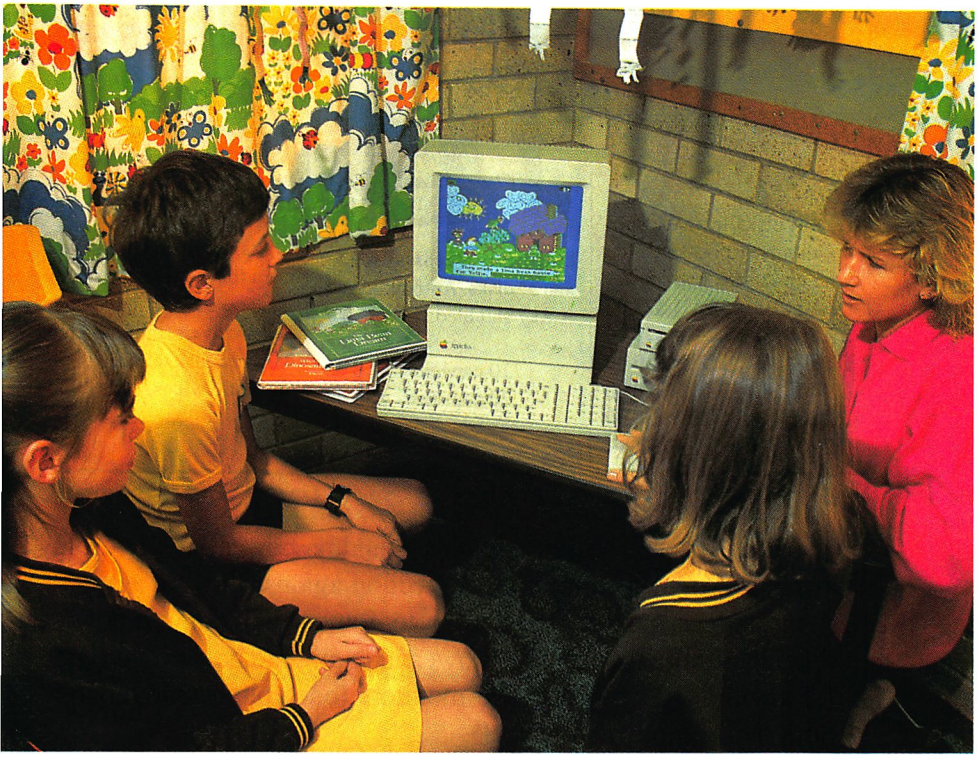
In 1987, St Bernards was selected by Dataflow as a school-based development site to produce teaching materials, and generate springboard ideas for the series of interactive and open ended software packages in the Explore-A-Story series. Each title comes with teachers' notes (to be supplemented by the work of the St Bernards' teachers) student work books, the program and student disks and story books. The program disk contains a few programs, one of which is a story (like The

Error

THE MARCH installment of Computers and Education focused on a number of issues including Concept Keyboards. There were a couple of inaccuracies, which have been pointed out to us, which we would like to put straight.

It was stated that 'although the Concept Keyboard is now compatible with a growing number of micros (IBM PC compatibles, Apples and Commodores), there may be limitations in the software availability.' Apparently there is no software available for Apple Computers using the Concept Keyboard. A couple of appropriate titles, however, have been bought to our attention for the Muppet Learning Keys. Representational Play and Exploratory Play from Peal Software (a US-based company) turn the Muppet pad into a number of large 'active' and 'dead' areas according to the software and the overlays used. To date these have been available only from the States, however, Edsoft, (03) 878 4899, may be able to help you out with enquiries.

Blue File Software, as mentioned in the article, is in fact not an Australian company, but a software series developed in the UK. Of the 52 packages which are available as public domain in the UK, only a handful are distributed in Australia through two exclusive agents – the Western Australian Department of Education and Alto Computers in Queensland.



As an experiment, eight programs in the Explore-A-Story series were left with the teachers at St Bernards by Dataflow, along with an Apple IIGS, supplied and supported by Apple Australia. As described by the school Computer Co-ordinator, Julie Irwin, their task was fairly open-ended – to produce materials which other teachers would be able to use with the program.

Lima Bean Dream) which is reproduced, in full colour as are the story books. Once the students have read the story on screen, or in the book, they can set about altering the text and graphics on screen or writing their own versions, utilizing the animated characters, objects and backgrounds on the disk, and adding their own words. Of course, the newly altered or written and illustrated stories can be printed in full colour (if you have the requisite equipment) or in black outline.

Carol McCormack, Sales Director at Dataflow, helped in selecting St Bernards and made the original presentation of ideas to key staff and then to a general staff meeting. Julie Irwin, the school's Computer Co-ordinator related the enthusiasm of Carol's presentation and the eagerness of the staff: 'Rosie the Counting Rabbit, an infants program was demonstrated, and everyone was impressed with the software. We were all eager to start.'

The eight programs in the series, at that time, were left with the teachers at St Bernards, along with an Apple IIGS, supplied and supported by Apple Australia. This supplemented the existing school's computers – a mixture of Apple IIs and BBCs. Their task was fairly open-ended – to produce materials which other teachers would be able to use with the program.

For the remaining weeks of the school year of '87, the teachers and students basically played with the software, fitting it in where they could during this typically busy and exhausting part of the educational calendar.

Early 1988 saw a more planned attack. The work was broken up into areas – Integration, Maths and Science, Music and Poetry, Language and Art and Craft and designated to different teachers. Four Apple IIes and the Apple II GS were shared by the ten teachers involved, with the Librarian supplying additional input in the form of appropriate literature which would tie in to the Explore-A-Story packages.

There were many ways the teachers attacked the programs and presented the material to the students. For some it was a matter of letting the students become familiar with the material and then brainstorming for ideas to use it. Others had the students read the story books, use the program and were in effect more structured. The process in general involved a great deal of interaction and basically three types of conferencing: student and teacher, student and student, and teacher and teacher.

There were several discoveries along the way. Kindergarten children took to the mouse (supplied with the IIGS) like it was second nature and thoroughly enjoyed the infants' programs which allowed them to illustrate with the computer, and do simple labelling and counting activities. Teachers also discovered the diversity of application and depth of the software. Because the programs have a lot of content and at the same time are open-ended, they could be used by different age groups for different purposes. The Grade 4 children loved Rosie, which although ostensibly used for labelling and counting, was applied by these children to imaginative story writing.

Irwin made no bones about how time consuming and challenging the task was. Trying to fit the development of these materials into a normal school teaching load was not easy. All of the staff benefited greatly from the experience – they learnt a lot more about the computers and indeed the software, they probably probed areas that they would usually leave alone and they interacted with each other more.

So what did they produce? During my visit to St Bernards, I was shown the fruits of their considerable labours – some 40 A4 pages generated on computer and pasted-up by hand and a number of hand written booklets. The depth of the material is a credit to all involved. A sample teaching program for language arts demonstrates how the Lima Bean Dream can be integrated into a theme of 'enjoyment', while the material on 'integration' explores the possibilities of using a number of the packages and extended exercises in subject areas including Health, Mathematics, Language, Science and Social Science.

The materials St Bernards generated are yet to be reproduced in a commercial form. Contact with Dataflow, however, reveals that the Supplement to the Teacher's Guide will be published mid-year.

As Irwin commented, 'We don't have time to re-invent the wheel in our day to day use of computers in schools. Developing this supplement has been involved and time consuming, but hopefully it will save other teachers time when they use the packages. This is not a definitive resource, but there are a lot of springboard ideas for teachers to use and build upon. I'm glad we had a hand in it!' □

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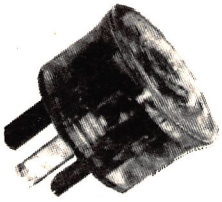
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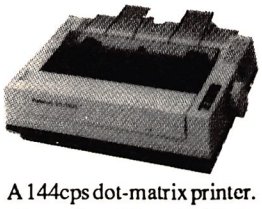
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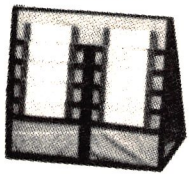
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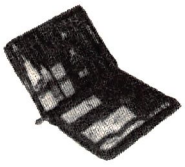
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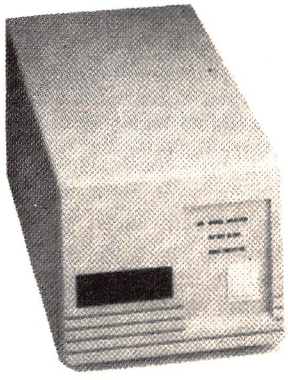
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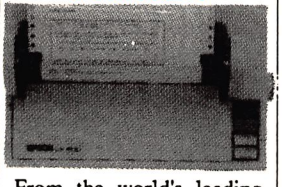
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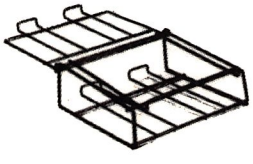
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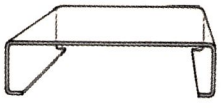
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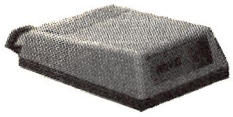
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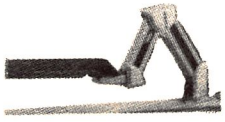
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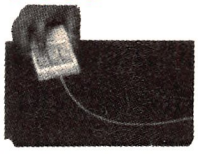
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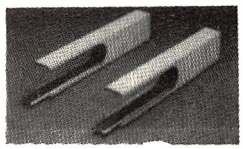
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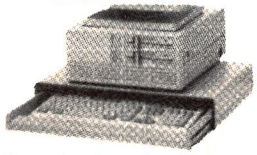
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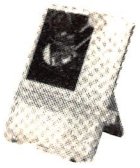
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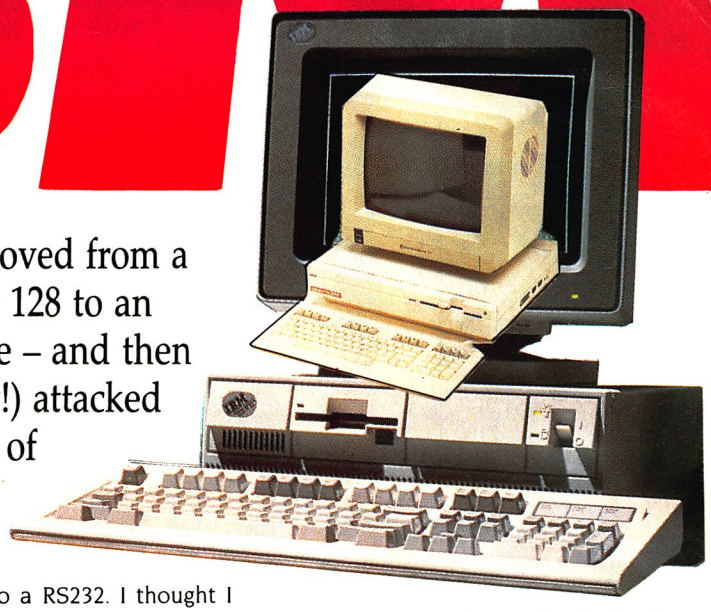
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CONVERTING TEXT FILES FROM CBM to IBM



Bruce Iliff moved from a Commodore 128 to an IBM machine – and then (successfully!) attacked the problem of converting text files.

AFTER SEEING WHAT was available on the software market for IBM compatible computers, I decided to upgrade from my trusty, though annoyingly slow, Commodore 128. I got hold of an Epson PCe with a 20-megabyte hard disk and new printer. The dilemma now was how to get nearly three megabytes of Commodore ASCII into the Epson in a usable form.

Initial queries to friends who had Commodore 64s and changed to IBM clones, were met with blank looks and statements that it was impossible or extremely difficult. I contacted some of the local Commodore dealers to see if they could shed any light on the subject. One suggested I buy two modems – one for the Commodore and the other for the Epson and let them talk to each other (I felt his main concern was to sell me two modems).

Undaunted, I continued my quest. It was a job that needed doing – I had some published articles, some not yet submitted and some still requiring more work. I finally found one helpful dealer who didn't greet me with that blank, faraway look, though he was still not confident. For a reasonable price, he sold me a device to convert the user port of the Commodore 128 to a RS232. I thought I was on my way.

The next problem was how to get the two machines to talk to each other. Or more simply, how to get the Commodore to talk to the Epson. The helpful dealer who sold the interface suggested I would need commercial software to do the transfer as it would be too difficult to write a program. This sounded alright – with my word processor on the Commodore, I could print to an RS232 interface. There are steps for setting the baud rate, parity, data and stops bits. I also had a spreadsheet program for the Epson that has a comprehensive communications section. I was on my way.

But no! This didn't work. I had visions of paying out hundreds of dollars to hire a typist or wasting my own time re-typing the text. With growing frustration I almost pulled my hair out as I changed the baud rate, data bits, stop bits and parity to every conceivable combination.

Finally I thought it was time to read through the very vague notes that came with the Commodore interface. The problem hit me in the face – I was sending direct from one RS232 to another RS232. The transmit line of one was going straight to the transmit of the other, and the handshaking lines were connected together. It didn't have a chance of working!

To solve this problem was more straight forward. It was away from the unknown ground of Commodore since there is a lot of knowledge in the 'public domain' about RS232s. I managed to borrow an adapter that swapped the cabling over so that the handshaking was correct and the transmit of one was going to the receive of the other (*If you'd like to make your own adapter, see 'Computer Connections' in the October, 1988, issue.*). With rising excitement I plugged the adapter in – it still didn't work!

I decided to do away with the Commodore word processor and try and write a program in Commodore Basic. The vague notes were gradually becoming clearer. At first it appeared like solving a puzzle, looking for a hidden clue in a many photocopied scrap of paper. Though it did give enough information to enable me to write two lines of code. One to open the interface and the other to print the word DATA to it. I ran this two-liner and felt like Alexander Graham Bell as the word DATA appeared on the screen of the Epson.

I quickly extended the program to read data from the Commodore disk and print it out the RS232. This worked, but presented another problem – the data was rubbish. It was IBM ASCII alright, but in upper case and making no sense. After some investigation, I discovered the data stored on the Commodore disk was not in the format expected. A lower case 'a' was stored as CHR$(197) in CBM ASCII, while in IBM ASCII it should be CHR$(97).

I decided to play it safe and convert every character to exactly what I wanted. And also only send the characters I wanted to send. This got rid of a lot of unwanted codes in the Commodore. The only problem was that it became a longer and therefore slower program.

Eureka!

I RAN THIS and saw a previously published article on sailboarding slowly print out on the Epson's screen. However, my problems were still not over. The next hurdle was how to get the data out of the communications package on the Epson and save it on disk. I read the spreadsheet's manual, punched the keys, transferred more data but couldn't get it onto disk.

It didn't take long to get frustrated and give up. I decided that if I can write a program for the Commodore to send data, I should be able to write one for the Epson to receive it. Out came the GW-Basic book to join the pile of manuals. Three lines of code later the Epson disk drive whirred.

Checking the file revealed it was not in exactly the format I wanted. For some reason there wasn't a line feed after every carriage return, an important feature in word processing files. The Commodore was sending a line feed after each carriage return, or so the flimsy piece of paper said. The Epson was supposed to be doing the same at the receiving end. I was close to the end of my tether so decided to add the line feed in the program on the Epson.

The line to print to disk on the Epson is (PRINT#1 A$;), after file number 1 has been previously opened of course. By checking for an incoming carriage return from the RS232, I was able to print the last character with (PRINT#1 A$). Leaving off the ';' added the line feed.

Finally it was working as I wanted. With a bit more programming I was able to set up both machines so they ran all night and slowly transferred an entire disk of information.

Initially I was worried that the Commodore might start to send a file before the Epson was ready to receive it. There was no problem because the Epson was running at 10Mhz while the Commodore in it's 'fast' mode was only at 2Mhz. The Epson was always ready to go while the Commodore was still thinking.

Unfortunately, the communications was only running at a relatively slow 2400 baud, compared to the 9600 baud the Epson was capable of. This is the fastest speed the Commodore RS232 could handle. And, the ASCII conversion slowed things down considerably.

Over a few nights I transferred all the files into a forest of directories and subdirectories on the Epson. Now I still have one more problem: anyone want to buy a well used Commodore 128, complete with its own RS232 interface? □

C128 text to IBM ASCII

This (plus two pieces of inexpensive hardware) is all that's necessary to convert C128 text files to IBM ASCII files –

```
10 open X,2,0,chr$(Y)+chr$(Z)  :rem open
       RS232 interface.
```

– where X is the file number (greater than 127 adds a line feed after every carriage return); 2 is the device number of the RS232; and Y sets the number of data bits, stop bits and the baud rate from the following table –

```
7 data bits  32
8 data bits   0

 50 baud      1
 75 baud      2
150 baud      5
300 baud      6
600 baud      7
1200 baud     8
2400 baud    10

1 stop bits   0
2 stop bits 128
```

Z sets the parity from the following table –

```
No Parity    0
Odd Parity  32
Even Parity 96
```

For example –

```
10 open 128,2,0,chr$(32+10+128)+chr$(0)
```

opens RS232 file 128, with a line feed to be added after each carriage return, sets the data bits at 7 (32), the baud rate at 2400 (10), the stop bits at 2 (128), and no parity (chr$(0)).

To send the word DATA from a Commodore 128 to an IBM compatible the following program lines are used –

On the Commodore 128 end:

```
10 open 1,2,0,chr$(170)+chr$(0)  :

20 print #1,"DATA"  :
```

On the IBM end:

```
10 open "com1:2400,n,7,2,asc"
for input as #1  :

20 a$=input$(4,#1)  :

30 print a$  :
```

I felt like Alexander Graham Bell as the word DATA appeared.

Introduction to Pascal - Part III

In May, John Taubenschlag demonstrated the use of complex commands and processes in Pascal. But – how do we read data from the disk drive?

ONE OF THE most important aspects of a computer system, whether it is a microcomputer or a mainframe, is its ability to store and retrieve information. Since the efficient use of storage devices is of the utmost importance when using a computer system, let's look at the basics of reading data from the disk drive.

For an example program, we'll simulate the Logo Turtle, a simple robot, which obeys a limited set of instructions (see Listing 1). The instructions used to communicate with the turtle are –

LEFT which rotates the turtle 90 degrees to its left;

RIGHT which rotates the turtle 90 degrees to its right;

FORWARD *x* which moves the turtle forward *x* units in the direction it is facing; and

STOP to end the movement of the turtle.

Using these four instructions, it will be possible to control the movement of the turtle. However, in this program, instead of typing in the instructions one at a time when prompted by the computer, they will be typed all at once into a file. The advantage is that if there are 100 instructions, the program can be run several times without having to type all 100 instruction over and over again. When the program is run, the file will be read, and after simulating the turtle's actions, its displacement calculated.

This is the format which the file, named TURTLE, must have –

LEFT FORWARD 19 RIGHT RIGHT FORWARD 4.5 LEFT FORWARD 9.45 LEFT RIGHT FORWARD 3 LEFT LEFT STOP

When the computer reaches the STOP instruction, it will compute the displacement of the turtle. There is no limit to the number of instructions which may appear in the file. However, there are four important characteristics to note: first, there is a single space between each command and/or digit; second, the number of units to go forward could be a real number or an integer; third, when creating the file, do not press the return key at the end of each line, rather let the editor wrap the text around to the next line; and fourth, the file must be typed in upper case.

New commands

BEFORE looking at Listing 1 in detail, let's cover the new commands it includes – there are four commands which have not been covered yet: infile, text, reset and the case statement.

Infile is not a Pascal command, rather it is a variable which was created for the purpose of allowing Pascal to open a file on the disk. Thus, infile is the name by which the file on disk will be referred to within the program. It must appear in three places –

First, it must be placed in the first line, within round brackets, after the program name. This tells the compiler that a file will be opened on disk. It does not necessarily have to be called infile, it could be called teacup, turtlefile, whatever.

Second, it must appear within the var section. Here, the file variable (infile), must be given a data type, in other words, a description of what data the file contains (see Part II for a discussion on data types).

Lastly, it must be found within the program. Here is where the file on disk is actually opened. Since it is necessary that the file be opened before the program tries to access it, it's a good idea to place the reset command in the initialise procedure at the beginning of the program with –

```
reset ( a , 'b' );
```

Where 'a' is the variable file name in the program (in this case infile), and 'b' is the file name on the disk (in this case TURTLE).

After the file is opened, the program can read from it. To do this, the read and readln statements are used. If a single character is to be read, we use –

```
read (infile,ch);
```

Where 'ch' is a variable defined to hold a single character. When data is read from disk with the read statement, an imaginary file pointer moves to the character immediately after the one read. Therefore, the next letter you read, will be the one which the pointer is on. However, if you use the readln statement as shown below the pointer will move to the first character on the next line after reading.

Unfortunately, Pascal generally doesn't allow you to read entire strings at a time, although some of the later versions do. Thus, if you want to read a string from a text file, such as a name, you must read one character at a time and store it in an array. For example –

```
for i=1 to name\length do
 read (infile,name\[i\]);
```

This will read a series of single characters, storing them into an array called 'name' (it is assumed that all the variables have been defined and a file has been opened).

The Pascal editor performs two tasks: first, each time you press the Return key, it places an EOLN (End Of LiNe) marker. Second, at the end of the file, it places an EOF (End Of File) marker. The importance of this, is that when reading from a file, the markers can be read in as characters. Therefore, you must be careful not to confuse the markers with the character you are trying to read. However, the markers have their use, since they can be placed in conditional statements, for example –

```
while not eof(infile) do
begin

 read (infile,num);
 total := total + num;

end;
```

```
program logo (output,infile);
 var
    ch,
    dir,
    com   : char;
    x,
    y,
    dist,
    howfar  : real;
    flag   : boolean;
    infile  : text;
 (* Procedure I - Initialising the variables *)
 procedure initialise;
 begin
    ch   := ' ';
    com  := ' ';
    dir  := 'N';
    flag  := false;
    x   := 0;
    y   := 0;
    dist  := 0;
    howfar := 0;
    reset (infile,'TURTLE');
 end;
 (* Procedure II - Reading and processing the instructions *)
 procedure trace\_turtle;
begin
   while (not eof(infile)) and (com <> 'S') and (not flag) do
   begin
     read (infile,com);
     case com of
        'L'   : read (infile,ch,ch,ch,ch);
        'R'   : read (infile,ch,ch,ch,ch,ch);
        'F'   : read (infile,ch,ch,ch,ch,ch,ch,howfar,ch);
        'S'   : writeln (output);
     end
     otherwise
        flag := true;

     if com = 'L'
     then
        case dir of
          'N'  : dir := 'W';
          'W'  : dir := 'S';
          'S'  : dir := 'E';
          'E'  : dir := 'N';
        end;
     if com = 'R'
     then
        case dir of
          'N'  : dir := 'E';
          'W'  : dir := 'N';
          'S'  : dir := 'W';
          'E'  : dir := 'S';
        end;
     if com = 'F'
     then
        case dir of
          'N'  : y := y + howfar;
          'W'  : x := x - howfar;
          'S'  : y := y - howfar;
          'E'  : x := x + howfar;
        end;
     if flag
     then
        writeln (output,'An error in the file has been detected.');
   end;
 end;
 (* Procedure III - Printing output to the user *)
 procedure printoutput;
begin

   dist := sqrt (sqr(x) + sqr(y));
   writeln (output);
   writeln (output);
   writeln (output);
   writeln (output,'Distance of the turtle from its starting point');
   writeln (output,'is : ',dist:10:2,' units.');
   writeln (output);
   writeln (output);
   writeln (output);
   writeln (output,'End of Program.');
end;

(* Main Program *)

begin

   initialise;
   trace\_turtle;
   if not flag
   then
     printoutput;

end.
```

Listing 1. *This simple Pascal program simulates the Logo Turtle. It reads the instructions from a file and, after processing them, gives the displacement of the turtle.*

Here, if the file pointer is not on the EOF marker thethe condition will be true, thus a number will be read and added to the variable total.

The case statement is the equivalent of a group of 'if' statements. Its format is –

```
case num of
 1 : score := 40;
 2 : score := 30;
 3 : score := 15
 4 : begin
    score := 0;
    writeln (output,'No score!');
  end;
end
otherwise
 writeln (output,'Number out of range.);
```

This works by using the variable num (which must have a value) to decide which statement will be carried out. If num is equal to 1, the first statement will be executed (that is, score := 40); if num is equal to 2, the second statement will be executed, and so forth. Only one of the statements in the case will be executed. The case statement is usually ended with an end, however, in this case, there is an otherwise command which performs the same task as the else. If none of the conditions are met in the case, the statement(s) after the otherwise command will be performed. It is important to note that if the otherwise command was not included and the variable num was out of range (that is, not equal to 1, 2, 3 or 4) the program would crash.

The case statement is not only limited to numbers. You may also use characters and boolean variables. For example –

```
case letter of
 'a','A' : writeln (output,'Pass');
 'b','B' : writeln (output,'Fail');
```

In this case statement, if the letter is equal to either 'a'or 'A', the first statement is carried out; but if letter is equal to 'b' or 'B', the second statement is carried out.

Now we'll cover each of the procedures in Listing 1 –

Procedure initialise: In this procedure all the variables are given their initial values. Also a file called TURTLE is opened using the reset command.

Procedure trace/turtle: Here, the computer simulates the movement of the turtle. These are the variables used:

flag – if true then an error on file has been detected.

com – is the current command which has been read in.

dir – is the direction which the turtle is facing.

ch – is a dummy variable to read in extra characters.

howfar – is the number of units the turtle moves.

x and *y* – are the co-ordinates of the turtle; its starting position is (0,0).

The steps which the program takes when tracking the turtle's movement are –

1) Check three conditions: first, check the file pointer is not at the End Of the File (if it is at the EOF and you try to read in a character, then the program will crash); second, check the present command is not STOP; and third, check the flag is not set to true. If any or all of these are true, then the procedure stops.

2) Read in a letter and store it in the variable com.

3) If com is equal to L, R, F or S then execute the appropriate statement; if not, then set flag to true. If com is equal to L, it means that the current command is LEFT. Therefore, four extra characters must be read (E, F, T and a space) such that the file pointer is moved to the first letter of the next command. The same is done with the RIGHT command, although five characters must be read since the word RIGHT is one character longer than LEFT. If com is equal to F, then the command is FORWARD. The same process is carried out, although this time, the number of units to go forward must also be read. If com is equal to S, nothing has to be done, since after the completion of the loop, the while statement will not meet all the conditions, since com equals S, and the procedure will end.

4) Check whether com is equal to L. If it is, the direction of the turtle must be changed. To do this, imagine the points on a compass: if you are facing north and you turn to your left, you will be facing west.

5) Check whether com is equal to R. If it is, apply the same reasoning as in number 4 above, but this time turning right.

6) Check whether com is equal to F. If it is, then increase or decrease x or y depending on the direction which the turtle is facing. For example, if the current direction is north, then the y co-ordinate must be increased; if the direction is west, the x co-ordinate must be decreased. The x or y co-ordinates will be increased or decreased by how far (units which the turtle moved).

7) Check whether flag is equal to true. If it is, an error has occurred with the file. An error message will be then printed on the screen. Flag would be set to true, if (and only if) the command (com) read in does not equal either L, R, F or S. If this happens, you must check the file for such things as spelling mistakes or extra spaces.

8) Go to number one above and repeat the process until one of the conditions in the while statement is not met.

At the completion of this procedure, if no error has been detected, x and y will each have a value which will be used in the calculation of the turtle's displacement.

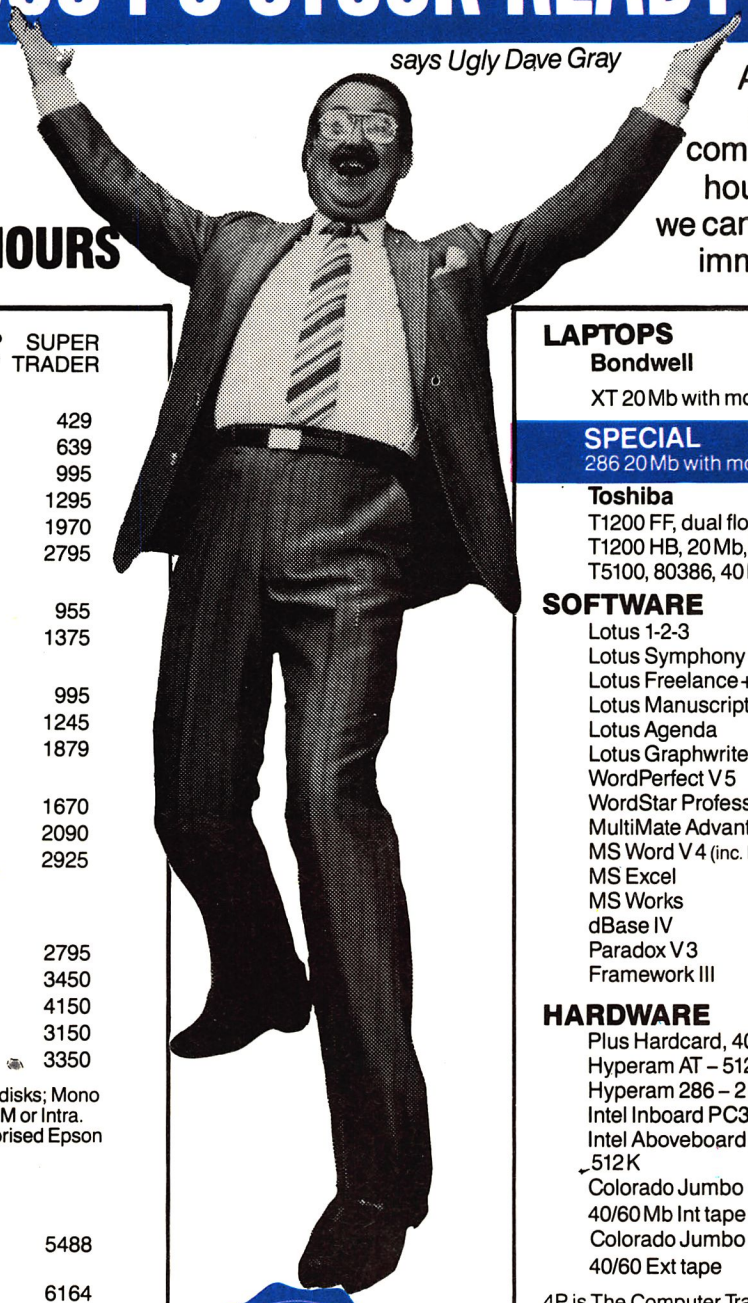
Procedure printoutput: In this procedure, the displacement of the turtle is calculated using the Pythagoras' theorem ($a^2 = x^2 + y^2$). The rest of the procedure prints out the results to the screen.

Main Program: Unlike the programs we covered in Parts 1 and 2, the main program section has an if-then statement in it. It is possible to place any statement(s) in the main program. In fact, you do not have to program using procedures at all, by writing the whole program in one block. However, a program is easier to understand and de-bug (check for errors) if it has been written in procedures. The if-then statement has been placed in the Main Program, to avoid printing out the results if an error has occurred with the data file (as explained above in the trace?turtle procedure).

That completes our introduction to Pascal – as you have probably noted it's an excellent starting point for novice programmers (as mentioned in Part 1, it was written primarily as a teaching tool). If you'd like to try programming in Pascal, the Microsoft implementation is $495 and Borland's Turbo Pascal is $210. □

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The Computer Trader

TCT 949



Database Data

The Last Emperor - Part II

In February, Steve Keen began his comparison of dBase IV with the Vandals at Ashton-Tate's gate, covering Relations and File Structures. Here he compares Applications Generators, Compilers and SQL implementation.

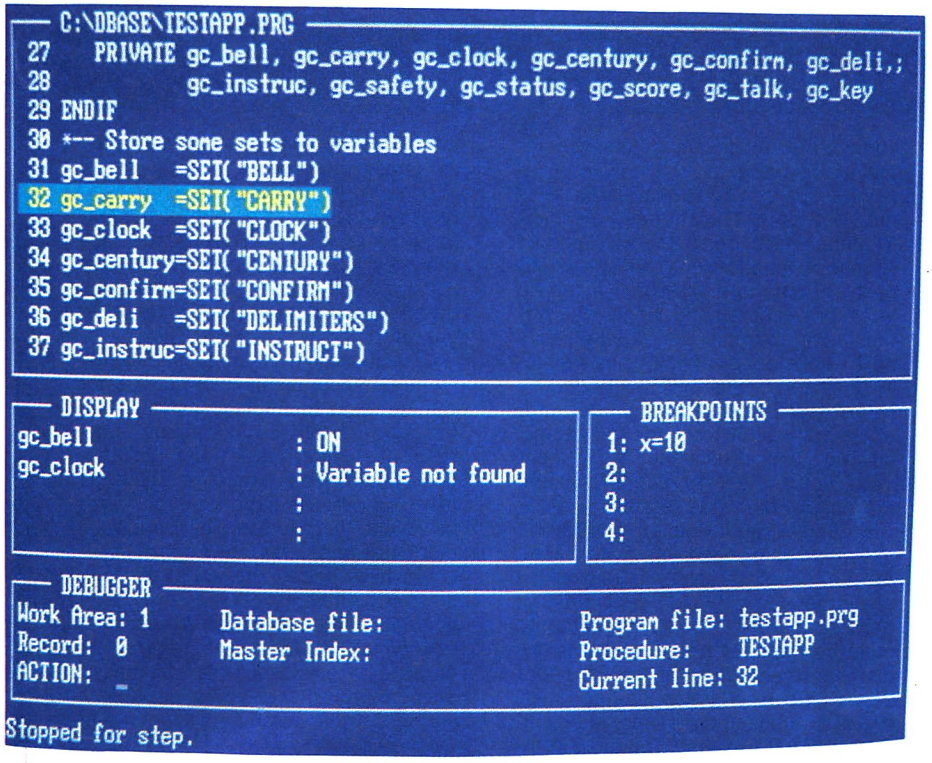
THAT DBASE HAS an Applications Generator is welcome – unfortunately, it's quite limited in power. With it you can design a menu-driven interface to an application, tying together selection of different options, forms for data entry, and reports – but it does not assist you in designing links between files.

For a start, it neither loads files into different work areas, nor does it assist in writing SET RELATION TO commands. You must write embedded code within the Applications Generator to achieve these effects.

One would think that it could use a View (admittedly one defined at the dot prompt, though) to take care of relating files. No such luck. The code that the Applications Generator writes, though it references the files and the work areas nominated in the view, neglects to copy the SET RELATION TO commands, or the indexes: using this view –

```
Sales.Vue

Use Invoice Index Invoice Order Icode
Select 2
Use Product Index Product Order Pcode
Select 3
Use Customer Index Customer Order Ccode
Select 1
SET RELATION TO PCODE INTO PRODUCT,
                CCODE INTO CUSTOMER
```



With dBase IV's Application Generator, you can design a menu driven interface to an application, tying together selection of different options, forms for data entry, and reports – but it does not assist you in designing links between files.

the applications generator produced this code –

```
Sale_Men.Prg - Written by AppGen
               from above View
*-- Before menu code
Select 2
Use Product
Select 3
Use Customer
Select 1
```

This gives the bizarre result that a form using file seek() and lookup() commands which worked quite well from the Control Panel crashes in use (after generation in the Applications Generator and successful compilation) with the message File not Indexed.

Because of this failure to relate, dBase falls down compared to at least one clone, Genifer, a third-party applications generator for dBase. A large part of Genifer's design was orientated towards linking related files (using the SET FILTER TO commands of dBase III). While Genifer's method was flawed (it allowed only a chain of one-to-many links), it was far better than nothing at all.

The only solutions with dBase, once again, are to write your own code from scratch, to go in and modify the Applications Generator's output to provide what it should have given in the first place, or to edit the templates from which the Applications Generator produces its code to include the effects you want.

But the sophistication of the resulting applications, and the quality of the code, pale in comparison to Clarion. Clarion is essentially a similar product to dBase, in that it relies upon programming for almost all of its intelligence, whereas Open Access, DataEase, Revelation and ZIM make considerable use of intelligent forms. Technically, Clarion defeats dBase because it is front-ended by a superb Applications Generator.

Clarion's Applications Generator (called The Designer) integrates the creation of files with the design of menus, tables and forms. Once files are defined, they become pop-up choices whenever a file name is required in the design of menus and the like – one of the advantages of a data dictionary. Similarly, field names are available in pop-ups when field names are required.

As you name and design each procedure, Clarion constructs a tree chart of your application, showing what each module does and how it relates to the other modules. In fact, virtually everything a professional developer would want to include in a package is already resident in the Designer.

A sales system can be designed in Clarion in under 20 minutes, from initial design of files to stand-alone EXE program. The code the Designer produces, which you can hand edit to add additional features, is fully structured and heavily commented. It is far superior code to that manufactured by dBase.

DataEase also lets a user design an application, complete with specialised menus for different users with different security levels, simply by choosing options from forms.

The other three Vandals – Open Access, Revelation and ZIM – do not have applications generators. But the amount of programming needed to get decent results out of any of them is dramatically less

Database Datum

IF YOU'D LIKE to know more about databases, Steve Keen reviewed Meta5 (an all-Australian product which allows creation of powerful applications without programming) in our May issue; in April, we reviewed Clarion (an excellent package for writing one-off applications) and in February we carried the first part of 'The Last Emperor'. The December 1988 issue gave an overview of the new specifications and improved functions in dBase IV. Three direct dBase competitors were discussed in November (Paradox v2, Focus and DataEase) as were two clones in September (VP Info and dBXL). August carried reviews on databases from integrated packages – Open Access, Enable, Smart and Ability Plus – plus RapidFile, a single file database and AskSam, a new concept in text-based databases. The first in our Database Data series appeared in the July issue and looked at four products from the low-end of the market: Memory Mate, Q&A, Reflex and DacEasy Base. If you missed any of these issues and would like back copies, refer to the Services page.

March of the Vandals

ASHTON-TATE'S focus on the clone competitors to dBase has allowed rival systems to steal an enormous march on dBase. From the users point of view, this is a great pity since dBase has dominated the market for so long, and there is such a mass of knowledge about how to drive it out there.

The person most responsible for dBase, Wayne Ratliff, has long since decamped from Ashton-Tate and those who have replaced him apparently weren't asked to make the kind of quantum leap in programming that Ratliff supplied with dBase II – it seems they were briefed simply to keep the old cart going forward.

In my opinion, dBase can no longer be regarded as the technical standard in microcomputer databases: that mantle has fallen to Advanced Revelation. Clarion, Revelation and Open Access offer a windows orientated design system, built-in 'relational' facilities such as 'pop-ups', 'lookup tables' and so on. Revelation transcends these two rivals with its variable length fields and multi-value fields, which represent a dramatic advance over the flat table confines of the conventional relational model.

The question is: though dBase is no longer the best, will it nonetheless remain the market standard?

The arguments for staying with dBase are the enormous number of applications written in dBase III+, its huge user base, and the degree of support which exists for it in the computing community. I have no doubt that, for some time, those arguments will remain convincing.

With dBase, a relational database is designed only when there is an overwhelming need for it. Otherwise, people shoehorn applications which would best be done in a relational database into spreadsheets and single file systems. For example, for several years now I have done my tax using Framework spreadsheets, because I couldn't be bothered writing and debugging a dBase application to do the same thing. Likewise, my University Department used Lotus 1-2-3 to handle student marking for the same reason.

Secondly, modifying an application to suit changing needs is a major chore. At the simplest level, if you follow recommended dBase programming practice and make users enter data into memory variables before updating the disk file, then adding a new field to a dBase file necessitates finding wherever that file is updated and adding an extra REPLACE clause. The more complicated thought of adding a new file to a database (such as adding suppliers to an invoicing system) is far more daunting.

With the five Vandals, I design a relational database whenever one would be a good idea. I wrote a three-file relational system in ZIM (complete with pop-up windows) in a weekend. My tax is now calculated with an Open Access database which has absolutely no programming, while an OA program now handles student marking. ZIM or Revelation will shortly take care of allocating students to tutorials.

Users will undoubtedly stick with dBase in the short run, but for the majority to stick with dBase in the long run, they will have to willingly continue working very hard to get results which others, using rival packages, get without effort.

Can dBase be enhanced sufficiently to meet the challenge? Certainly a lot can be done to improve its multi-file handling simply by revamping functions like valid(), seek() and lookup(). The Applications Generator could be made to produce superior code (comparable to that produced by Clarion) by editing its templates. The Control Panel could have added the ability to load files into different work areas, to create genuine views rather than simply queries which could be empowered to enter data into multiple databases. Such improvements could put dBase within striking distance of Clarion and Open Access.

But fundamental changes, like a data dictionary (rather than a Catalog) and entity-relationship file linking as offered by ZIM and DataEase, variable length records, multi-valued fields and dynamic hash table accessing (the last two being Revelation's unique strengths) are enormous modifications, requiring recoding from the ground up (plus a degree of innovation that Ashton-Tate hasn't offered since dBase II). I simply can't see dBase undergoing that kind of transformation.

than with dBase, because the basic package does so much more.

Compilation

DBASE HAS a pseudo compiler (a tokeniser) built-in, which evaluates an entire application before attempting to run it. This is perhaps the major technical advance of IV over III, resulting in programs running at least several times faster.

For a genuine compiler, with which the developer can produce standalone EXE programs for sale, you have to go to the Developers Edition (which may be available by March next year). This will result in faster still code, which (I am told) will also be very compact.

Clarion, Advanced Revelation and ZIM all offer compilers; ZIM's is an optional extra (about $800). Open Access has a runtime module and there are plans to release a compiler shortly.

Interactive use

THERE ARE two levels of interactive use of dBase: the Control Panel, and the dot prompt. The Control Panel does not enable you to operate dBase as a multi-file program, except in data queries. You cannot enter data into multiple files, or verify that data entered into one file matches that in another, without first exiting to the dot prompt, loading files into work areas, specifying indexes, setting-up the relationships between files, saving these settings as a view, and then returning to the Control Panel and selecting that .VUE file.

The dot prompt provides the same classic, English language interface to multiple files that Wayne Ratliff designed over five years ago, augmented by the ability to reference fields from several files in the same command line, and the enhanced relational features of the SET RELATION TO and SET SKIP commands.

Open Access lets you use SQL to define queries for forms which access multiple databases. These forms can then be used direct from OA's menu system to enter data into multiple databases, or to query multiple files.

While it lacks a command line system, its implementation of SQL (though far from as complete as dBase's) using its Retrieve menu option lets you do the same sort of mass manipulation of records, that are possible from dBase's dot prompt. There is no command line in DataEase: everything is accessed from a menu. However those menus make it a breeze to link multiple files – something which can't be said for dBase.

Programming

DBASE'S programming language continues to grow, with both new terms

and enhanced old ones. Some of the new terms are greatly welcome, especially Window and related effects. Likewise, some of the extensions to old terms are appreciated – such as the extended Browse command discussed in February.

The debugger facilities have also been extended, with several windows showing the code that is executing, the state of memory and system variables. However dBase is clearly starting to suffer from diminishing returns from each extension to the language.

The first and major reason is that dBase's limited file handling powers means that the language has to do far more work than is required of code within Open Access, Revelation and ZIM. In none of those packages do you have to SELECT work areas, USE files and the like – so long as the file exists in the dictionary for the application, they are automatically accessible.

Similarly you don't need to worry about whether fields are indexed or not when deciding which command verbs to use; again the programs take care of data retrieval, indexed or not. Views in Open Access and ZIM can update and add to multiple databases; one-line commands can update all relevant fields in a database from an associated form, unlike dBase's separate REPLACE clause for each field/memory variable pair.

Finally, dBase's growth by extension involves adding more and more adverbs and adjectives to each command. Browse now has 14 modifiers. That's not as bad as packages like SAS, which have as many as 80, but it's still enough to appear Byzantine to inexperienced users, and to tax the memory of the professional.

The bottom line with all of dBase's competitors is that far less programming is required to get results than with dBase. Despite this, all bar DataEase (which has no built-in language; it achieves all its magic using forms) offer languages which are better than dBase. As usual, most of the superiority derives from the underlying file structure of each program.

Clarion offers the most complete programming language. However ZIM offers the best integration of databases and language, while Open Access is very easy to learn and capable of most database tasks. Revelation has R/Basic (a structured language, despite its name), for those very few tasks which cannot be achieved using its Windows system.

The real selling point of Clarion is the Designer. Without it, Clarion would be just

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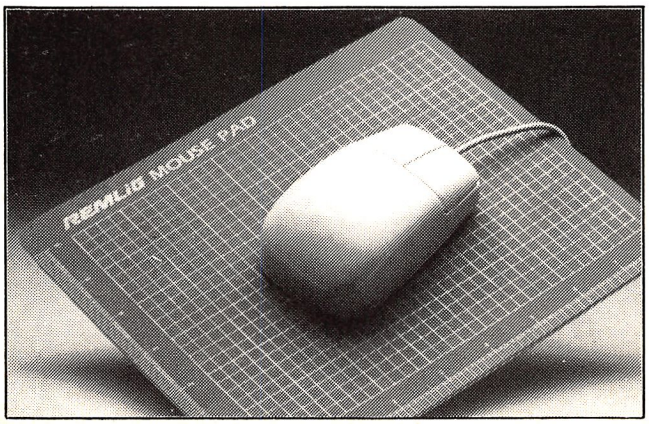
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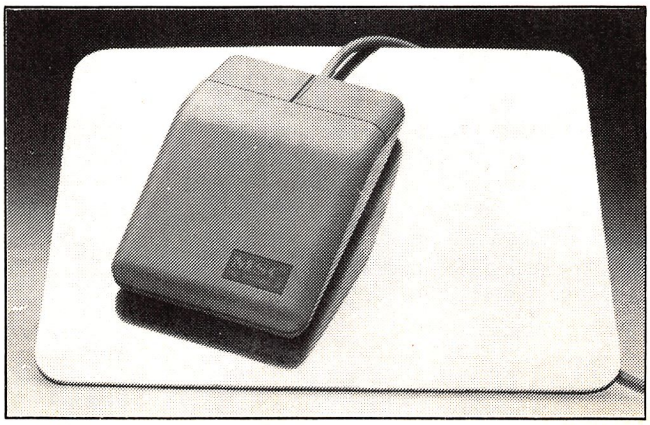
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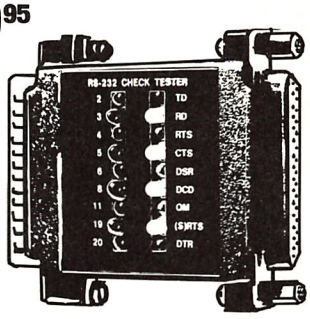
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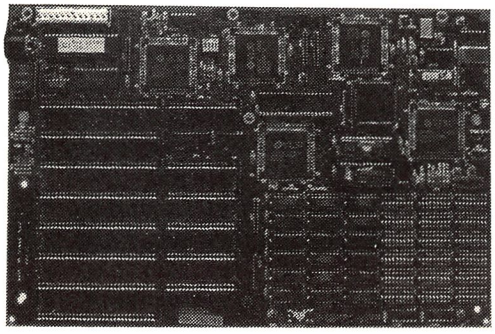
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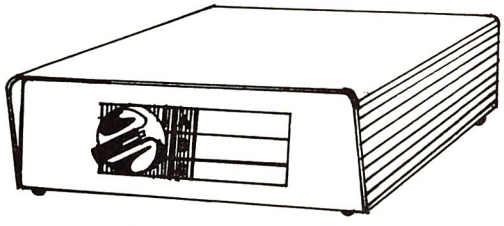
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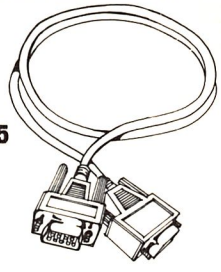
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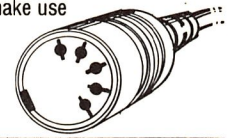
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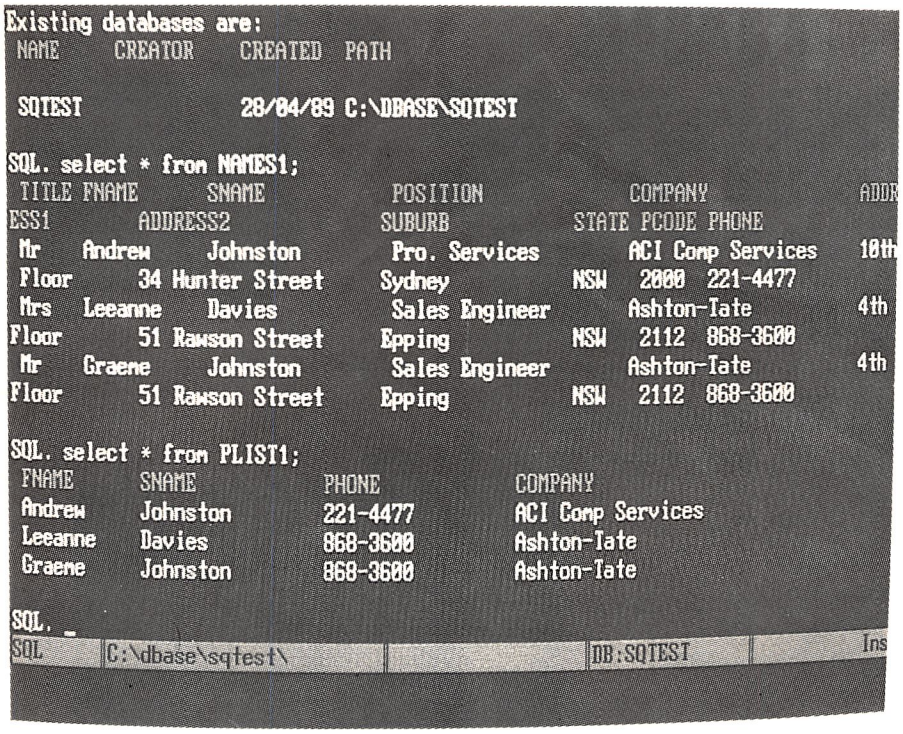
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dBase IV offers a pretty complete implementation of SQL (Structured Query Language, a standardised means of querying a multi-file system to extract information). Unfortunately, the implementation involves some unavoidable clashes with dBase's own language, so you have to specify SQL mode before issuing an SQL command.

another competitor on the business languages front. With it, it is a prototyping tool which can do 95 per cent of the work in a complex application in less than half an hour, leaving the professional developer free to concentrate on the finer points.

ZIM's language shows the best integration of language and data, courtesy of its entity-relationship model and its powerful forms.

Open Access provides numerous user interface 'hooks' such as built-in menus which incorporate choice selection (unlike dBase's menus) windows with titles and prompts, and so on. If you have defined an entry screen which accesses seven files, then the simple command 'GET ScreenName' lets you access all the database's power to enter verified data into each of those seven files.

Open Access also has the best development environment, with code executing in a window in the top half of the screen, while the current line is displayed in the bottom half.

Open Access, Clarion, Revelation and DataEase all import directly from dBase, creating a file of the same name as the source DBF file, but with their requisite suffixes. Tailoring the files to their new masters involves nominating 'must match' fields in Open Access (and putting in whatever External fields you desire), defining suitable screen forms in Clarion and DataEase, creating XREFs and Popups in Revelation.

ZIM imports only from text files, either SDF (comma delimited) or columnar. The first step is to export the dBase data to a text file; next define a ZIM file with appropriate fields of the required lengths, then append from the text file.

SQL

DBASE IV offers a pretty complete implementation of SQL. For those who haven't yet discovered Structured Query Language, it is a standardised means of querying a multi-file system to extract information. It can also be used to design databases and enter data into them.

While SQL is a useful data query standard between databases (though everyone seems to follow a slightly different model), it isn't as effective for designing databases as, for example, ZIM's entity-relationship model. However, SQL does provide a means of getting information from multiple files that eventually everyone in business will know.

Thus far only Open Access and ZIM provide SQL implementations (with ZIM's being an added cost item). It is used transparently at several stages, such as in database design when the form you design actually creates an SQL query which defines the file. This superior integration into the package makes it rather easier to drive (with pop-up windows showing file and field names to assist in designing a query), though your strict access to SQL commands is limited compared to dBase. Revelation promises SQL sometime in the future.

Limitations

NOT EVERYTHING is rosy with our five Vandals beating on the Emperor's gate – each has a few problems which complicate their use. Open Access suffers from an awkward labelling of function keys (using functional labels like '<do>' rather than 'F10'), difficulties in redefining database fields (its strong 'typing' implies that it was written largely in Pascal), the absence of some useful database functions in its programmer, poor error messages in Programmer, and the absence of index searches in its Views.

Clarion's 'in-form' programming sometimes results in unpredictable or undesired effects. For best results you have to edit the final source code, and that requires a fairly intimate knowledge of Clarion's language. It also omits some simple functions, such as a method of incrementing counters for customer codes (it's necessary to write your own formula to accomplish this).

ZIM is a programmer's tool; there is no way that a first-time user should be exposed to it. Its main problem used to be incomprehensible manuals, but thankfully an excellent 'cookbook', *NIVA's Guide to ZIM*, is now supplied. Its data dictionary approach is so purist that it takes some getting used to.

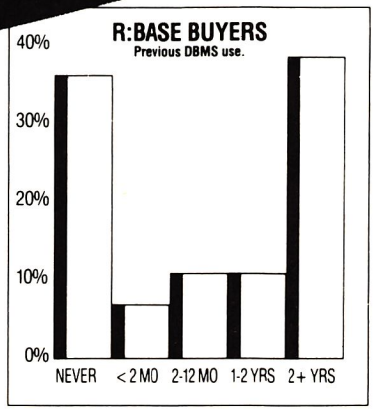
Revelation's problems, if it has any, are its power and flexibility. It offers a complete accounts and security system, its own internal filing system (with 50 character file names), and comprehensive data management facilities; you can do virtually anything from its windowing system, which results in a range of design options that simply take time to learn. It is not a system for a first time user, whereas most first-timers could get decent results rapidly from either Open Access or DataEase.

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To a programmer, one of the most useful chips in a PC is the 8253 timer chip – understanding how it works, is important to understanding how a PC operates. Tom Moffat's in the Mode. . .

ALTHOUGH ITS efforts aren't quite as visible to the user as those of the Video Controller or Disk Controller chips, the IBM PC's 8253 timer is one of the most useful ICs to the programmer. Most of its functions are already spoken for in the IBM/-Compatible computer, but we can divert its activities for our own purposes when we want some event to take place regularly, or after a carefully measured length of time.

You could, for instance, use the timer chip to make the computer flash something on the screen exactly once every second. I use the timer chip in a program which decodes radioteletype signals taken from a shortwave receiver. Here it is necessary to generate delays of exactly 20 milliseconds (20 thousands of a second) to time the separation of incoming serial data bits. In another application, a facsimile receiver, the timer chip is used to make the computer sample the incoming picture information exactly 1440 times a second. In both applications, the timing information is very accurate and steady, and the programs will run on any IBM/Compatible computer, regardless of the computer's clock speed.

It must be made clear from the start that the timer chip we're talking about is completely independent of the clock generator associated with every machine operation in an IBM PC. The clock generator fires-off pulses that trigger and synchronise instruction execution in the main microprocessor, as well as data transfers to and from memory or input/output ports. The 8253 timer chip has nothing to do with this; it just sits there on its own patch of the system board, doing its own thing.

The higher the main clock speed, the faster any program executes, and the race is always on among computer manufacturers to achieve higher and higher clock speeds. The standard clock speed for an IBM PC/XT or clone is 4.77MHz, that is, 4,770,000 pulses per second. Turbo PC/XTs can be switched up to 8 or 10MHz, under hardware or software control.

Clock action

LET'S IGNORE the 8253 timer chip for a moment and look closely at the PC's main clock action. Many reference manuals for the 8088 microprocessor state how many clocks each type of instruction requires to execute. For instance, the act of copying the contents of an internal register into the accumulator register takes two clock pulses. But copying the contents of an external memory location into the accumulator takes ten clocks; five times as long.

Knowing how many clocks each instruction takes, you can produce fairly accurate time delays by writing a machine code version of a for/next loop. You can then add up the clocks required for each trip through the loop, and work out how many repetitions of the loop are needed for the required time delay. But obviously any change in the speed at which the clocks are generated will change the time taken for the time delay loop to execute. Since there are so many different clock speeds in use in various PCs, a loop time delay written for one may be totally wrong on another. The independent timer chip overcomes this problem nicely.

The PC's 8253 timer chip has its own little clock pulse generator, which feeds pulses to the timer chip *and nothing else*. The timer chip's exclusive clock pulse generator produces pulses exactly 1,193,180 times a second. This is true in any PC that calls itself IBM Compatible, no matter what main system clock speed it happens to use. The timer chip simply counts its incoming stream of pulses, and produces an output signal when the prescribed number of pulses has occurred. You, the programmer, tell the timer chip how many pulses that will be.

Sound effects

THIS discussion of the 8253 timer chip has ignored the chip's sound effects capabilities. This is such a big subject it would take a separate article to do justice to it. But you may have noticed that the IBM PC is capable of producing quite remarkable sound effects, with just this simple chip and some sneaky programming.

One of the cleverest sound effect programs I've seen is a little utility called DRAIN.COM. I think you're supposed to bury it in some unsuspecting person's AUTOEXEC.BAT file. So, when they boot up their PC, they get a message showing some obscure fault code. And then, 'Water detected in disk drive'. The computer then emits some very convincing gurgling sounds as the 'water' is drained away. Next comes a spin-dry cycle with further jazzy sound effects.

This little program has brought howls of laughter from people who know about computers. But my dream is to somehow plant a disk containing DRAIN.COM into the government office where my wife works. They've recently got a nice new Whykickamookow PC which nobody knows much about and most are afraid of. Can't you just imagine the panicky phone calls when they boot the disk and get 'water detected'!

The 8253

PHYSICALLY the 8253 Programmable Interval Timer, as it's properly called, is a 24-pin integrated circuit similar to many others in the IBM PC. Eight of the pins connect to the system data bus and two connect to the two lowest address lines (for selecting one of four internal ports). There are a few control and power pins, and the remainder of the pins are hooked-up to the timer inputs and outputs.

Actually there are three totally separate timer mechanisms within the 8253 clock chip. They operate independently of one another, each counting a different number of input pulses to produce different delays. The chip is even capable of having three different clock pulse rates sent to the three separate counters, but in the IBM PC all three clock pulse inputs are wired together. So all three of them get 1,193,180 pulses each second.

The three individual timers are called channels, and are numbered 0, 1, and 2. Each channel has a 16-bit latch register which records the number of pulses it is meant to count before generating a finished counting signal. The actual counting takes place in a counting register; it begins with a number which is initially copied from the latch register. Each incoming clock pulse then decrements the

counting register by 1, and when the counting register reaches 0, the time delay is complete.

As mentioned above, the inputs and outputs of each channel connect with actual pins on the 8253 integrated circuit, which have to be wired-up to some other part of the computer before they're of any use. As well as the three clock pulse inputs which are all tied to a source of 1.19318 MegaHertz pulses, there is a gate input for each channel. This is a bit like a tap: turn it on and pulses flow to the counter, turn it off and they're blocked and the counting stops. Each of the three channels also has an Out pin which signals the results of the timer's activities.

Software communication with the timer chip is via four 8-bit input/output ports, which in the IBM addressing scheme are located at 40, 41, 42, and 43 (hexadecimal). The first three ports are for feeding 16-bit numbers into or out of each channel's latch register. (Whoops! An 8-bit port for a 16-bit number? That's right, they're transferred 8 bits at a time, the lower eight followed by the upper eight.) The last port, 43h is a command register for selecting various modes of operation for the three counters. The highest two bits of this register select which of the three counter channels the instruction is aimed at.

If all this sounds too good to be true – it is, because the computer automatically takes charge of all three timer channels when it boots up. If you want to use one of the channels, you are going to have to steal it back. However, there are dangers, and traps for the unwary!

Type 8 interrupts

CHANNEL 0 should be fiddled with only if you're brave, and don't mind messing-up your disks. Its Gate input is permanently wired to a logical high signal on the PC's system board, so its counter is always running; there's no way to turn it off. Channel 0's Out line goes through some other hardware and eventually connects to the PC's interrupt system, becoming the Type 8 interrupt in the master interrupt table. The table entry for Type 8 consists of four bytes containing a segment and offset address where the PC's program counter will jump whenever Timer Channel 0 finishes a time delay cycle.

The Type 8 interrupt's main purpose in life is to drive the PC's time-of-day clock. Channel 0's latch register is loaded with the biggest possible 16-bit number, 65535, so the count takes as long as possible. An interrupt is generated by Channel 0's Out line once every 55 milliseconds. The software associated with interrupt Type 8 causes a memory location to tick over, in turn incrementing another, which increments another, and so on.

No problems so far. If you play around with timer Channel 0 your time-of-day clock goes haywire. So what's a clock between friends, you can always reset it. But a fact not immediately obvious is that Channel 0's 55mS pulse is also used to set the disk drive motor timing. I have

```
Microsoft (R) Macro Assembler  Version 4.00          5/20/88 17:01:59

                        PAGE    55,132
                        TITLE   Triggered timer demonstration
                ;
0000            CSEG SEGMENT BYTE PUBLIC
                ;
                        ASSUME CS:CSEG, DS:CSEG, ES:CSEG, SS:CSEG
                ;
                ; This program demonstrates a time delay that lies
                  dormant
                ; until the DELAY subroutine is called, which then
                  triggers
                ; the timer and waits until the timer counts down to
                  zero
                : before returning.
                ;
0010                    .RADIX  16
0100                    ORG     100H
                ;
                ; Initialize timer Channel 2 for Mode 1, Binary
                  Counting,
                ; Write LSB-MSB.
                ;
0100  B0 B2     START:  MOV     AL,0B2  ;TIMER COMMAND: 1011 0010
                                        (Binary)
0102  E6 43             OUT     43,AL   ;SEND COMMAND TO 8253 COMMAND
                                        REG.
0104  B8 FFFF           MOV     AX,0FFFF;FOR LONGEST POSSIBLE TIME
                                        DELAY
0107  E6 42             OUT     42,AL   ;LSB TO LATCH REG.
0109  8A C4             MOV     AL,AH   ;MOVE MSB INTO AL
010B  E6 42             OUT     42,AL   ;MSB TO LATCH REG.
                ;
                ; Timer is now set up, waiting for a trigger before
                  running.
                ;
010D  E8 0122   STAR:   CALL    DELAY
                ;
0110  B0 2A             MOV     AL,'*'  ;CHARACTER TO WRITE ON SCREEN
```

Listing 1. *Listing to produce a delay that runs only when the 'DELAY' subroutine is called. Program execution is kept busy within the subroutine until the delay is finished; the timer then falls dormant until 'DELAY' is called again. This type of 'triggered' time delay is used where you want to time some event that doesn't occur regularly.*

```
0112  B4 0E            MOV     AH,0E   ;WRITE IN TELETYPE MODE
0114  B7 00            MOV     BH,0    ;DO IT ON TEXT PAGE 0
0116  CD 10            INT     10      ;BIOS ROUTINE FOR VIDEO
                                        FUNCTIONS
                ;
0118 B4 01          MOV   AH,1  ;CHECK IF ANY KEY HAS BEEN PRESSED
011A CD 16          INT   16    ;BIOS ROUTINE FOR KEYBOARD FUNCTIONS
011C 74 EF          JZ    STAR  ;PRINT ANOTHER STAR IF NO KEY PRESSED
011E B4 00          MOV   AH,0  ;FUNCTION TO TERMINATE PROGRAM
0120 CD 21          INT   21H   ;DOS INTERRUPT.
                ;
                ; Subroutine triggers counter, waits until finished, returns.
                ;
0122 E4 61  DELAY:  IN    AL,61 ;GET THE CONTENTS OF 8255 PORT B
0124 0C 01          OR    AL,1  ;TURN THE GATE BIT ON
0126 E6 61          OUT   61,AL ;GATE HIGH, OUTPUT LOW, COUNTER RUNS
0128 50             PUSH  AX    ;SAVE ALL BITS OF PORT B FOR RESTORE
0129 E4 62  DELAY1: IN    AL,62 ;CHECK CONTENTS OF PORT C
012B 24 20          AND   AL,20 ;SELECT BIT 5, TIMER 2 OUTPUT
012D 74 FA          JZ    DELAY1 ;KEEP CHECKING UNTIL OUTPUT GOES HIGH
012F 58             POP   AX    ;DELAY FINISHED, GET PORT B CONTENTS
0130 24 FE          AND   AL,0FE ;TURN THE GATE BIT OFF
0132 E6 61          OUT   61,AL ;GATE GOES LOW, TIMER SHUTS DOWN
0134 C3             RET
                ;
0135        CSEG    ENDS        ;END OF SEGMENT
                ;
                        END     START
```

***Listing 1** – continued.*

found that playing around with Channel 0 will cause merciless trashing of your disks if you try to write to disk.

This is a shame, because it would be nice to be able to set-up a source of carefully timed interrupts for your own use. *If* you carefully saved the original Type 8 interrupt address before changing it, and *if* you made sure you didn't use the disks during the program, and *if* you re-programmed Channel 0 when you finished, and *if* you then restored the interrupt address, I suppose you could get away with using Channel 0. But, especially if my PC depended on a hard disk, I wouldn't touch Channel 0 with a ten-foot pole!

Channel 1 is no-go territory, and should never be changed. Its Gate input is again wired to a logic high, so, like Channel 0, there's no way to turn it off. Its Out line is tied to the PC's DMA (Direct Memory Access) chip, so that it causes the PC's dynamic memory chips to be periodically refreshed. The Channel 1 counter is programmed to count only 18 pulses per timer cycle, so its Out line sends a pulse to the DMA every 15 microseconds.

Dynamic memory chips (instead of Static chips) are used in many computers, the PC included, because they're cheap and fast. The cost is important when there's 640K of memory. But dynamic memory's biggest disadvantage is that its contents tend to bleed away and have to be periodically kicked back into shape by a read cycle.

If you reprogram Channel 1 and interfere with the refresh pulses, your memory contents go bye-bye and your computer goes crash.

Channel 2 appears to be the only one which is entirely safe to pinch for your own programs. It too is programmed with a purpose when the computer boots-up. It makes the computer go beep – and that's all! If you mess-up Channel 2 your computer doesn't go beep any more. It might instead go squeak or boop but it's certainly not going to crash.

The other good news is that Channel 2's Gate input and Out line have been wired into the PC in such a way that you can get at them with software. They are both accessed through the PC's 8255 Programmable Peripheral Interface chip. We won't delve into the details of this chip – it's only necessary to know that Channel 2's Gate input appears as Bit 0 of Port Address 61h, and the Out line appears as Bit 5 of Port 62h.

The Out line also makes its way through to the speaker circuit. The thing would always be bellowing at you, were it not for Bit 1 of Port 61h which is a special gate signal to turn the speaker on and off.

Programming the 8253

WE BRIEFLY mentioned modes above – there are six different modes, or ways in which each timer responds to loads on its latch register or gyrations on its Gate input. Each mode also determines what will happen on the Out line when the timer completes its time delay. Bits 3, 2, and 1 in the Command Register form a 3-bit number that specifies which mode is to be used. (Remember that Bits 7 and 6 specify which timer channel the command is meant for.) That leaves Bits 5 and 4, which indicate how counter latch read/writes are to be handled, and Bit 0 which selects binary or BCD counting.

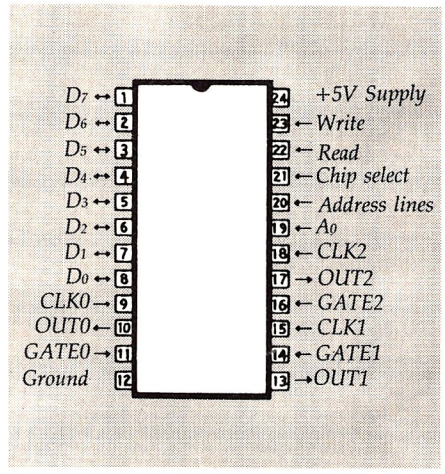


***Figure 1.** The 8253 'Programmable Interval Timer' is a 24-pin integrated circuit similar to many others in the IBM-PC. Eight of the pins connect to the system data bus and two connect to the two lowest address lines (for selecting one of four internal 'ports'). There are several control and power pins, and the remainder of the pins are hooked up to the timer inputs and outputs.*

Note that it is possible to *read* as well as *write* the latch register. And, you can copy the current value of the counter register into the latch. This means you can check

the progress of the count, if this takes your fancy. The programming to do this is a little messy, though. For reference, descriptions of the modes are in a separate boxed item.

Remember that you can inspect Channel 2's output only through Port 62h Bit 5. If you wanted to check the state of the output line as quickly and as often as possible, you would write a short machine code routine to read the port into the accumulator register, select Bit 5, and then keep doing it over and over until Bit 5 reaches the state you require.

Now even with a very fast computer, there would be something like 10 microseconds between each inspection of Channel 2's output. With the output pulse length only 0.8 microseconds, it's highly likely the pulse would go low and then high again without your machine code routine ever being aware of it.

I spent a lot of time trying to use timer modes with pulse outputs before I figured out why they wouldn't work properly. The problem will never occur if you use Modes 0, 1, and 4 which leave the output in one state or another for a reasonable length of time. The pulse output modes are only useful for triggering interrupts, as in Channel 0, or directly triggering other chips such as the DMA in Channel 1.

It is fortunate that Modes 4 and 5 work the same as Modes 0 and 1, except with a steady level output. And the square wave output of Mode 3 is just as useful as Mode 2's continuous pulse output, perhaps even more so.

If you are using Channel 2 in your program, and your program also uses the VDU's beep character (Ctrl-G), you will find that the computer has reprogrammed Channel 2 for the beep frequency. Your own time delay value will be lost. The way to prevent this is to trap any Ctrl-G's before they ever get to the BIOS character handling routines. It's much quieter, anyhow.

```
                    ; Write LSB-MSB
                    ;
0100  B0 B2         START:  MOV     AL,0B2  ;TIMER COMMAND: 1011 0010
0102  E6 43                 OUT     43,AL   ;SEND COMMAND TO 8253
0104  B8 FFFF               MOV     AX,0FFFF;FOR LONGEST POSSIBLE DELAY
0107  E6 42                 OUT     42,AL   ;LSB TO LATCH REGISTER
0109  8A C4                 MOV     AL,AH   ;MOVE MSB INTO AL
010B  E6 42                 OUT     42,AL   ;MSB TO LATCH REGISTER
                    ;
                    ; Timer is now set up waiting for a trigger
                    ;
010D  E8 0122       STAR:   CALL    DELAY
                    ;
0110  B0 2A                 MOV     AL,'*'  ;CHARACTER TO WRITE ON SCREEN
0112  B4 0E                 MOV     AH,0E   ;WRITE IN TELETYPE MODE
0114  B7 00                 MOV     BH,0    ;DO IT IN TEXT PAGE 0
0116  CD 10                 INT     10      ;BIOS ROUTINE FOR VIDEO
                    ;
0118  B4 01                 MOV     AH,1    ;CHECK FOR KEY PRESS
011A  CD 16                 INT     16      ;BIOS ROUTINE FOR KEYBOARD
011C  74 EF                 JZ      STAR    ;PRINT ANOTHER STAR
011E  B4 00                 MOV     AH,0    ;FUNCTION TO TERMINATE PROGRAM
0120  CD 21                 INT     21H     ;DOS INTERRUPT
                    ;
                    ;Subroutine triggers counter
                    ;
0122  E4 61         DELAY:  IN      AL,61   ;GET CONTENTS OF 8255 PORT
0124  0C 01                 OR      AL,1    ;TURN THE GATE BIT ON
0126  E6 61                 OUT     61,AL   ;GATE HIGH, OUTPUT LOW
0128  50                   PUSH    AX      ;SAVE ALL BITS OF PORT B
0129  E4 62         DELAY1: IN      AL,62   ;CHECK CONTENTS OF PORT C
012B  24 20                 AND     AL,20   ;SELECT BIT 5, TIMER 2 OUTPUT
012D  74 FA                 JZ      DELAY1  ;KEEP CHECKING
012F  58                    POP     AX      ;DELAY FINISHED, GET PORT B
0130  24 FE                 AND     AL,0FE  ;TURN THE GATE BIT OFF
0132  E6 61                 OUT     61,AL   ;GATE GOES LOW, TIMER OFF
0134  RET
```

Listing 2. *Listing to make the timer run continuously once Channel 2 is programmed for Mode 3, the square-wave output. With the timer on its way, the main program then goes off and does its own thing, in this case printing a star. It then enters the 'WAIT' subroutine to await a low-to-high or high-to-low transition of the square wave which is already running.*

Programming hints

LET'S LOOK look at several practical time delay routines. They're written in Assembler, but if you're not into that you'll still be able to understand what we're trying to do by following the comment lines in the programs. Both routines use timer Channel 2, and they both produce a string of stars (*) printed on the screen. The speed at which the stars are printed is determined by the time delay routines.

The two listings look similar, but they are very different in the results they're meant to achieve. Listing one produces a delay that runs only when the DELAY subroutine is called. Program execution is kept busy within the subroutine until the delay is finished; the timer then falls dormant until DELAY is called again.

This type of triggered time delay is used where you want to time some event that doesn't occur regularly. When the event unexpectedly occurs, you want the timer to start at that instant – you don't want it to already be running. This particular example was pinched from a radioteletype receiving program. A teletype circuit spends a lot of its time sitting idle when no information is being sent. When the start of a character arrives, *that's* when you want to start timing it!

The timer in Listing 2 runs continuously

once Channel 2 is programmed for Mode 3, the square-wave output. With the timer on its way, the main program then goes off and does its own thing, in this case printing a star. It then enters the WAIT subroutine to await a low-to-high or high-to-low transition of the square wave which is already running.

As the square-wave begins its next half-cycle, the main program goes off and prints another star. It then enters the WAIT subroutine again. So two things are happening at once: the program is doing its work, while the timer is running in the background, never stopping or starting. This scheme is used when you want something to occur at nice regular intervals. It's the one I use in the Facsimile program to time the sampling of incoming picture information.

An interesting characteristic of this free-running timer is that for a given value written into the latch register, the delay produced will be only half as long as that produced by a triggered delay. This is because the free-running routine is only measuring half-cycles.

As you may have guessed by now, the free-running scheme can fall down if the main program doesn't finish its work in time to get back to the WAIT subroutine before the timer's Out line changes again. If the delays are very short, or the code is long, you may have to work your way through each instruction, adding-up the number of clocks for each one. This will ensure that the time taken by all of them will fit into the space between timer half-cycles. Remember that the machine code clocks are not the same ones feeding the timer chip, and the faster your computer's clock speed, the more instructions will fit between the timer's half-cycles.

Now fix an eye on Listing 2 and we'll take a close look at how to send a programming command to the timer chip. At the line labeled START is the magic number that will tell the timer what is required of it. Let's take the number apart, bit by bit.

The number in hex is B6, or in binary, 10 11 011 0 (it's split apart in that strange way so we can see what the groups of bits do). The first '10' (2 in decimal) says we are going to program Channel 2. The next group, '11' tells the timer we will load its latch register with a 16-bit number; the lowest 8 bits followed by the highest 8 bits. Next along are three binary bits, '011' (3). This specifies Mode 3. Finally a single bit, '0', for binary counting. '1' would specify BCD counting.

8253 Mode descriptions

IN THE following mode descriptions, 'low' and 'high' refer to logic levels on the 8253's pins; 'low' is 0 volts and 'High' is about +5 volts. If using Channel 2, you would see these as an 0 or 1 state of the appropriate bits in the in/out ports.

MODE 0: When you first program Mode 0 for a particular timer channel, its output goes low. It assumed the gate is already set high. The instant you load the counter latch register, the counter begins counting. When the count reaches 0, the output goes high. If, during the time delay, you pull the gate low, the count will simply 'hold' until the gate is sent high again. The count then resumes where it left off.

MODE 1: Electronic types would see this mode as a programmable one-shot multivibrator. It is assumed the gate is low to start. When the mode is selected the output goes high. Once you load the latch register with the time delay length, the timer sits waiting for a 'trigger' from the gate. When you raise the gate high, the counter starts and the output goes low. When the counter reaches 0 the output returns high. If, during the count, you pull the gate low and then high again, the output will remain low but the counter will have its starting number reloaded from the latch register. This 're-triggering' feature means you could hold the output low indefinitely as long as you kept pulsing the gate low from time to time before the counting register ever finished its count.

MODE 2: This one generates a continuous stream of pulses as long as the gate is kept high. The delay time between each pulse is determined by the value loaded into the latch register. Each time the counter register reaches zero an output pulse is generated, the counter register is reloaded from the latch, and the process repeats. The output pulse is a little 'blip', which goes from high to low to high again within the time between two incoming clock pulses. This is very short indeed. Mode 2 is the mode used in timer Channel 1 to produce refresh pulses for the memory chips.

MODE 3: A square wave generator. This runs continuously as in Mode 2, except that instead of emitting short pulses, the output goes high for half the count and low for the other half. If the gate is pulled low the square wave output will pause, with the output remaining in the high state. Once the gate is pulled high again, the square wave output resumes. This is the mode used for generating sound effects from the speaker.

MODE 4: This is identical to Mode 0, except that a short high-low-high pulse is generated at the end of the count. Recall that Mode 0 stays low for the full duration of the time delay, going high only at the end.

MODE 5: Identical to Mode 1, except that the output is a pulse instead of a continuous level.

Note: If you are using Channel 2 of the 8253 timer chip, you will probably find Modes 2, 4, and 5 useless. This is because these modes have 'pulse' instead of 'level' inputs. The pulse length is only one incoming clock pulse period, $^1/_{1,193,180}$ second, or around 0.8 microsecond.

Next the command number is sent to the command register, 43h, by an OUT instruction. The chip now expects two more bytes representing the value destined for its latch register. We first place the delay length in the AX register. In this case we use the hex value FFFF for the longest possible time delay. (Why so long? Damned if I can remember...)

Now the AX register is split into its two 8-bit parts, AL for the lower half and AH for the higher half. AL is first sent into the chip via Port 42, closely followed by AH which is moved into AL for the transfer.

Timer Channel 2 is now ready to run in Mode 3, so let's switch it on. We first move the contents of port 61 into the AL register and use an OR instruction to force Bit 0 (the Gate bit) on. We don't want to disturb the other bits which are used for other purposes. Finally we send the contents of AL back into the port, the Gate goes on, and the timer starts running. You should be able to figure out the rest of the program from the comments. The only tricky bit is the XOR instruction in the WAIT subroutine. This doesn't look especially for Bit 5, but will respond to a change in any bit. It simply assumes that Bit 5 is the only one likely to change.

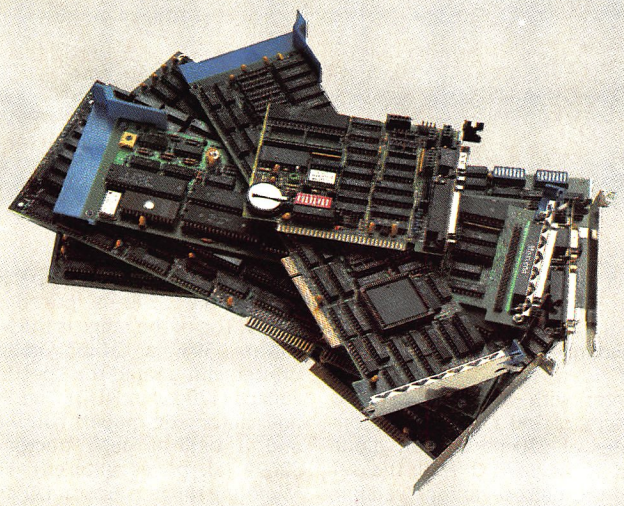
Now back briefly to Listing 1, the triggered delay. Note that we set-up Channel 2 for Mode 1, and we didn't immediately turn the gate on. This happens down in the DELAY subroutine. The gate is turned on, starting the timer. We then keep looking at the output until the delay is finished. We then turn the gate off again, ready for the next use of DELAY. □

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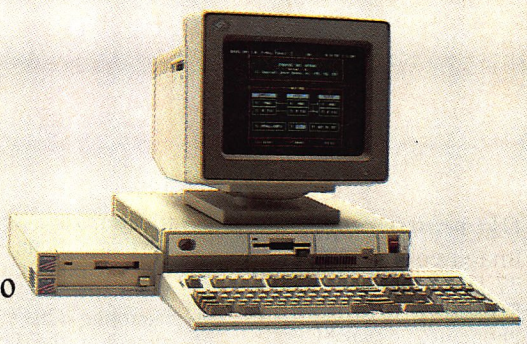
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Phone: (02) 697 8681
Price: See below

IPL-Datron, the Australian distributor, have appointed Imagineering national retailer for the Oki Microline range of printers. The entry level machine is the Microline 320, a 9-pin machine aimed at the home, education and small business market. Offering 250cps in Super Speed Draft mode and 40cps in NLQ, the 320 has a large range of menu-selected typefaces as standard – $439. The Microline 391 is a wide-carriage 24-pin printer with a maximum print density of 360 *x* 360 dots; it operates at 270cps in draft mode and 90cps in NLQ. Both the 391 and the narrow-carriage version, the 390, have parallel and Centronics interfaces and a wide variety of typefaces, selectable with a credit-card sized typeface card – the $390 is priced at $1399. Top of the range is the Microline 393, a 24-pin colour printer with a rated top speed of 450cps (120cps in NLQ). The 393 has automatic paper handling and a built-in push tractor – $2699 (all prices untaxed). The Microline range is Epson LQ and IBM ProPrinter compatible. IPL will continue to offer service and technical support themselves.

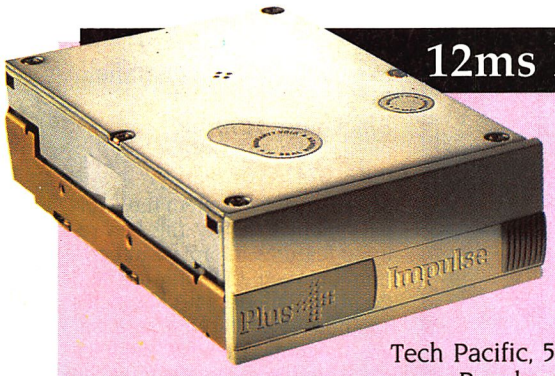


NEAT 21Mhz Laptop

Chicony LT3400 Laptop
Teco Australia, 335 Woodpark Rd, Smithfield 2164 NSW
Phone: (02) 725 1233
Price: Not supplied



Teco has added the Taiwanese-manufactoured Chicony Laptop to its range. Using the 80286 NEAT (New Enhanced AT) 16Mhz chipset, the machine also offers a 21.4MHz turbo mode by means of a Harris 80C286 CPU. The standard configuration has 1Mb (expandable to 5Mb of EMS 4.0) RAM, a single 3½ inch floppy drive and a 28 millisecond 40Mb hard disk, with an Autopark facility; the display is a 12-inch (diagonal) gas plasma screen. For expansion, the LT3400 features a port for adding an external 5¼ inch floppy drive, two serial and one parallel ports, connectors for a CGA, MGA or EGA monitor and an external, full-sized keyboard, and one half-sized AT expansion slot.



12ms Pulse

Plus Impulse drive system

Tech Pacific, 5 Epsom Rd,
Rosebery 2018 NSW
Phone: (02) 697 7111
Price: $1245 40Mb system; $1645 80Mb system; $400 Cluster Disk Interface

The half-height Plus Impulse drive system is available in system kits with a 40 or 80Mb hard disk, a host adapter card, cables and mounting kit; the system also includes software for running under DOS 3.*x*, 3Com 3+ and Novell Netware. While the drives have a rated average seek time of 19 milliseconds, Plus have added a high-speed controller and a proprietary caching system, DisCache, to achieve an effective access time of 12 milliseconds and a transfer rate of 4Mb/sec (assuming 50 per cent sequential and 50 per cent random reads) – the caching system employs a 'least-recently-read' algorithm to determine which data to load to the cache for multiple accesses. Each Cluster Disk Interface adapter supports up to 16 Impulse systems; up to 32 can be daisy-chained from from one server using a second adapter. The system also includes a disk management system that locates potentially bad sectors on the disk and locks them out from use.

Price: $2795 PC4602
$5495 PC4641

Running on an 80188 processor at 10MHz, Sharp's new battery-powered laptops feature a back-lit, supertwist LCD display. The display offers a resolution of 640 *x* 200 in four shades of grey and emulates CGA, MDA and AT&T's 6300 standard. Using the power saving features – user-set backlight time-out and hard disk time-out – the lead battery can provide power for up to four hours of use. The PC4602 is configured with 2 3½ inch floppy drives and weighs 5.5kg, while the PC4641, weighing 6.1kg, has a single floppy drive and a 40Mb hard disk with an access time of 45 milliseconds. Both units offer 90 keys with a separate numeric keypad, 640K of RAM (expandable to 1.6Mb of EMS memory), a parallel printer port, a 9-pin serial port and interface for an external 5¼ inch floppy drive. An RGB port for a CGA or monochrome monitor is optional.

Cadkey/UX

Minicomp Pty Ltd
104 Mount St,
Nth Sydney 2060 NSW
Phone: (02) 957 6800

Price: from $5000

Intended for use on Silicon Graphics personal 3-D workstation, Personal Iris, Cadkey/UX is compatible with the entire Iris 4D series. This Unix implementation of Cadkey feature three-dimensional modeling with a 3-D database, construction planes and conics construction, and solids modeling, taking full-advantage of the Personal Iris' graphics features, including real-time rotation of wire-frames, solids and 'smooth' shaded parts. Cadkey/UX can share files between Unix and PC-based systems without translation, so that existing Cadkey files can be used.

Sonar Professional text retrieval for Macintoshes

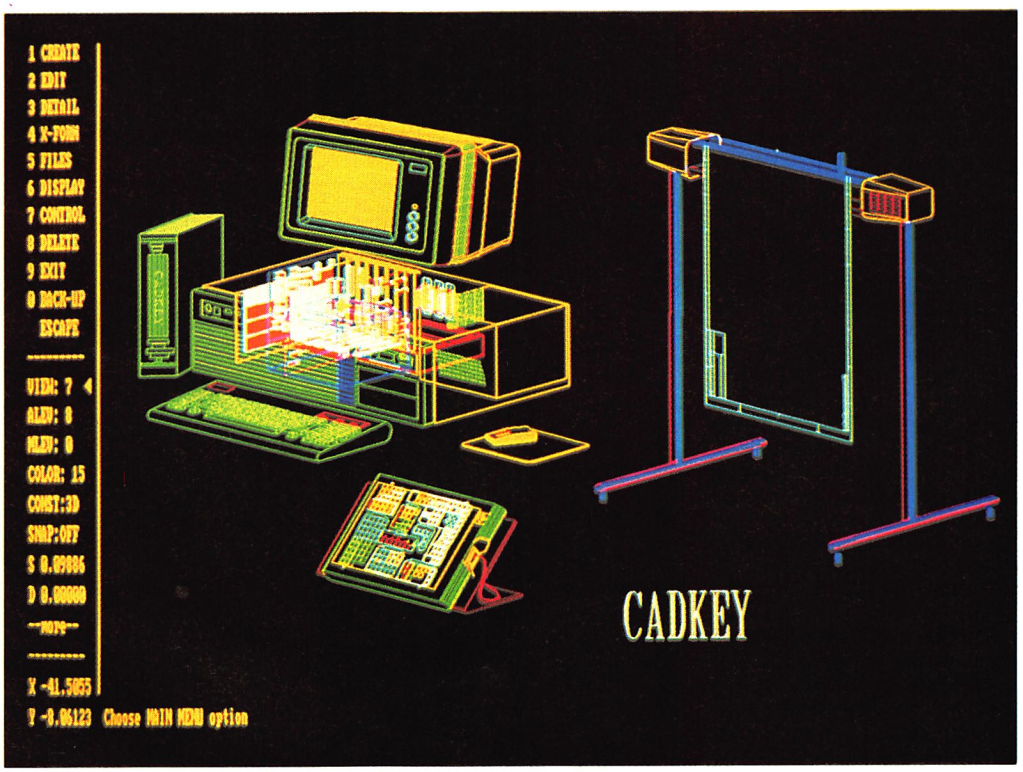
Laser Peripherals,
12 Barcoo Ave,
Roseville 2069 NSW
Phone: (02) 905 0050
Price: $1139

Sonar Professional v2 is a Hypertext-based text retrieval program for the Macintosh. The package can search through documents in MacWrite, MS Word, WriteNow, WordPerfect, More, MS Works and ReadySetGo v4 for-



Sharp PC4600 laptops

Sharp Corp
1 Huntingwood Dr,
Blacktown 2148 NSW
Phone: (02) 831 9111



mats, as well as free-form and DOS ASCII text – on a Mac II, search time is rated at 4000 pages per minute. Version 2 has added synonym searching, which allows a user to define alternative finds 'on the fly' – for example, if the search is for 'brainwave', the user can specify 'electroenceph' and 'EEG' as synonyms for the search. Another new feature is Associational Searching which gives an alphabetical list of all words used in the same paragraph as the word or phrase specified for the search (within the same documents). Hypertext links (genealogies) can be saved and reused – an 'automatic Hypertext' feature lets a search be interrupted in order to add notes or perform related searches on the same document. A 'link file' can be used to pre-define standard search words and phrase and set-up complex Boolean searches.

LattisNet Concentrator and Transceiver

Tech Pacific
5 Epsom Rd,
Rosebery 2018 NSW

Phone: (02) 697 7111
Price: $4988 Concentrator
$246 Transceiver

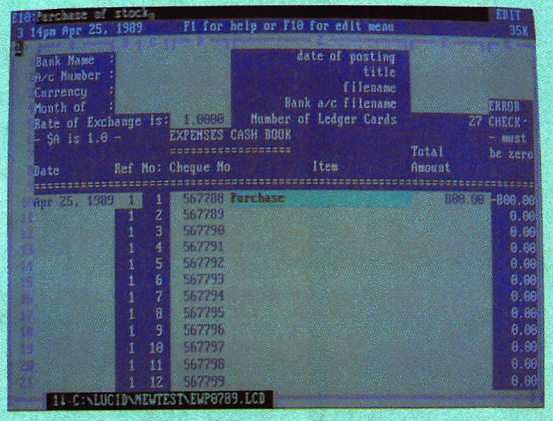
The Western Digital LattisNet Concentrator allows the connection of up to eight computers in a star configuration using twisted-pair cables. Used in conjunction with Western Digital's EtherCard Plus TP adapter, the Concentrator supports Ethernet (802.3 as well as versions 1 and 2), baseband and other LattisNet networking products. Performing full multi-port repeater functions (as specified in IEEE 802.3), the Concentrator can be used to link a number of star configurations to each other and to an Ethernet network. Included software provides diagnostics of for network activity as well as monitoring data collisions.

The LattisNet Transceiver enables any Ethernet AUI cable from a PC, mini, mainframe or workstation to be attached to a twisted pair network by adding a Transceiver between the Concentrator and network station – the maximum length allowed by the system is some 270m.

A Lucid Bookkeeper

3-D Bookkeeper

Bill Aronson and Assoc, 5a New St, Bondi 2026 NSW
Phone: (02) 387 5669
Price: $499



Written in Lucid 3-D, this bookkeeping package has been designed to imitate manual systems and is intended for use by small businesses, particularly those with little or no computer experience. The package, which is memory resident, allows full access to the accounting modules from most other applications, such as word processors and databases – it also offers an on-line calculator and notepad as well as full access to Lucid 3-D files; a conversion facility for Lotus 1-2-3 files is included. As well as the three-dimensional spreadsheet feature that will be familiar to users of Lucid, QubeCalc and similar spreadsheets, this Australian-written program offers password protection, the ability to attach notes to individual cells in the spreadsheet, automatic updating of profit and loss statements, balance sheets and trading accounts, plus error checking on the Cash Book. 3-D bookkeeper requires an IBM (or compatible), Lucid 3-D and a hard disk with at least 3Mb free. Free telephone support is offered by the distributor during normal office hours during the first month of use.



HP Graphics Gallery

Hewlett-Packard Australia
31 Joseph St,
Blackburn 3130 Vic
Phone: (03) 895 2895
Price: $747

An enhanced version of the original Graphics Gallery, this new release features improved integration between the Drawing and Charting Galleries; all chart types can now be accessed from a single program. The two modules are available separately or as the Gallery Collection, which adds the Business Management Portfolio picture library. Drawing Portfolios, which include more than 1800 professionally drawn illustrations for business, the chemical and petrochemical industries and law offices, can be added as options. The new version is now compatible with the computer graphics metafile format and supports encapsulated PostScript files. Users can now directly import ASCII files from any word processor. Other enhancements include a palette of 130 on-screen colours, additional charting types and improved line-editing features.

Document Holder

DSC Management
46 Capella Ct,
Glen Waverley 3150 Vic
Phone: (03) 560 6176
Price: $27.50

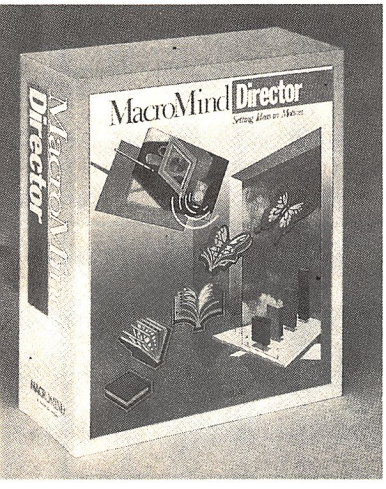
DSC has released a range of document holder designed to attach directly to the side of a terminal or monitor, saving desk space. The holders, made of clear acrylic, attach to the unit with Velcro strips on either the left or the right. They are available in A4 and legal paper sizes and can hold up to 20 sheets. The acrylic used provides 98 per cent light transmission which means it does not block or distort the background.

StatView for the Mac

Pica Pty Ltd
38 Ardoch St,
Essendon 3040 Vic
Phone: (03) 370 3566
Price: $595 StatView SE
$725 StatView II

Providing a range of descriptive, comparative and multivariate statistics with eight standard nonparametric tests (such as the Chi-square, Kruskall-Wallis and

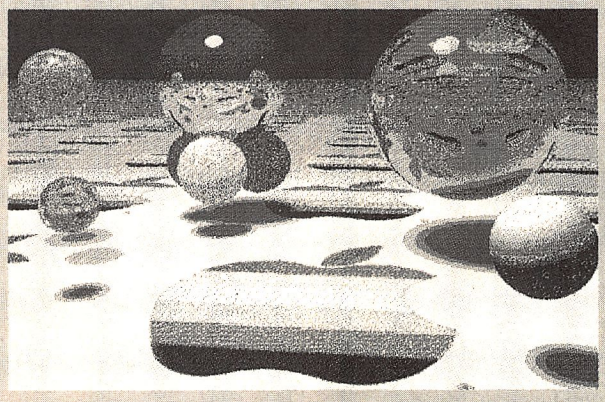
Friedmann tests), Statview uses a spreadsheet supporting up to 8191 variables and 32,765 cases; data can also be imported using ASCII files or from Excel. Twelve types of charts and graphs can be produced; these include scattergrams, factor plots, linear and polynomial regressions, univariate charts and comparison percentile charts. The package offers 35 transformations as standard – these include a full range of trigonometric and logarithmic functions. StatView SE requires a Mac Plus or SE, 1Mb of RAM and operating system file version 4.2 or later. StatView II requires 1 Mb of RAM and a 68881 or 68882 maths coprocessor and OS 4.2 or later.



MacPaintJet

HP PaintJet for the Macintosh

Hewlett-Packard Australia, 31 Joseph St, Blackburn 3130 Vic
Phone: (03) 895 2895
Price: $204 Macintosh interface; $2236 PaintJet



Using an interface kit, the PaintJet can now be used with QuickDraw-based software including MacDraw II, MS Word 3.02, Excel 1.5, PowerPoint 2.0 and Cricket Presents. The kit supports 256 colours on a Mac II, and 8 on the SE and Plus and provides a range of bit-mapped fonts from 10 to 36 point.

MacroMind Director

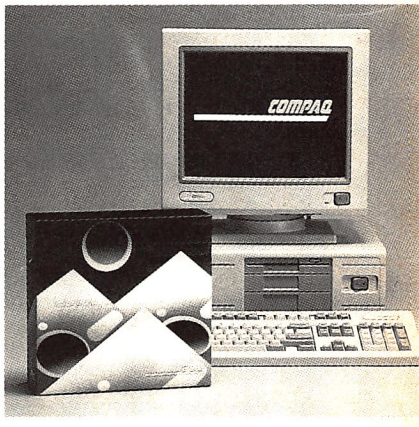
Firmware Design
6 Station St,
Blaxland 2774 NSW
Phone: (047) 39 4288
Price: $1175

This Macintosh program contains tools for combining text, graphics, animation, audio and video images. It's intended for professional use to create desktop video productions and story boarding, visualising complex or abstract scientific and engineering concepts and to create interactive learning applications. Any image that can be displayed on a Macintosh screen can be used by the program. MacroMind Directory is VideoWorks II compatible and upgrades are available. New features include automatic animation, titling and other text effects, enhanced sound and music feature, advanced colour palette control and pop-up menus and on-line help.

Compaq MS-DOS 4.01

CCA Systems
100 Harris St,
Ultimo 2009 NSW
Phone: (02) 660 0077
Price: $302

Compaq's latest DOS release features the Fastart utility which is designed to simplify the setting up a new PC. It partitions and formats hard disks, installs or upgrades MS-DOS and customises the system configuration. Other enhancements to DOS include an MD-DOS shell with a graphical interface incorporating menus, windows icons and inte-



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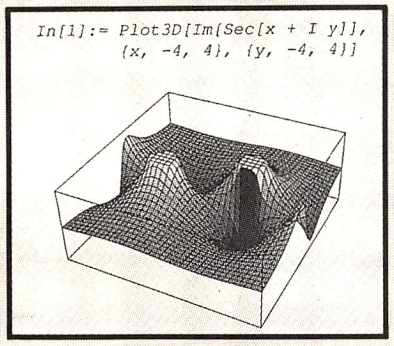
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Mathematica

Mathematica for DOS machines

Pica Pty Ltd, 38 Ardoch St,Essendon 3040 Vic
Phone: (03) 370 3566
Price: $1345 '386 version; $1915 '387/'287 versions; $2485 Weitek version



Not only is Mathematica a powerful calculator, but it can find logarithms, perform calculus and solve differential equations. While the package's powerful graphics and function display facilities were designed with maths and physics students in mind, it has found application in most areas that require serious mathematical analysis. Numeric features include matrix operations and basic statistical analysis and symbolic features include tensor and list operations, plus expansion and factoring of polynomials. Graphs can be produced in two or three dimensions and in varying contour and density formats and exported to any application that supports PostScript; expressions can be exported as C, Pascal or TEX code. Functions can be defined procedurally or with rule-based definitions and added to the function library supplied with Mathematica. Minimum system requirements are an 80386 PC running under DOS 3.*x*, 640K of RAM expanded to 1Mb (2 is recommended), 6Mb of free hard disk space and CGA graphics. The package supports EGA, VGA, MCGA, Hercules and IBM's 8514. Documentation is a 750-page book, *Mathematica*, written by the program's principle author, Steven Wolfram – the book is available separately for $40 from technical and computer bookstores.

grated mouse control; single file and logical partition support for up to two gigabytes; support for LIM/EMS 4.0; and file system and command enhancements including support for the Mem command, which displays information about the configuration and allocation of memory, specifies the programs being used and how much memory is allocated or free. Compaq indicated that 4.01 is compatible with IBM DOS 4.01 and earlier versions of Compaq DOS and that they will continue to offer Compaq DOS 3.31.

Compaq MS OS/2 1.1

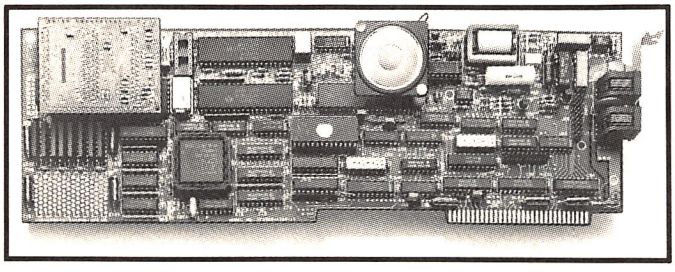
CCA Systems
100 Harris St,
Ultimo 2009 NSW
Phone: (02) 660 0077
Price: $629

Compaq's version of MS OS/2 1.1 features Presentation Manager, a dual-boot facility that allows either MS-DOS or OS/2 to be booted on start-up, up to 16Mb of addressable RAM, single file and partition support up to 2 gigabytes and their own on-line help for OS/2 commands. Compaq have also added mode speed control for software, hardware speed alignment and improved disk caching software. The system requires a '286- or '386-based machine with 2.5Mb RAM and a hard disk.

Xafax card

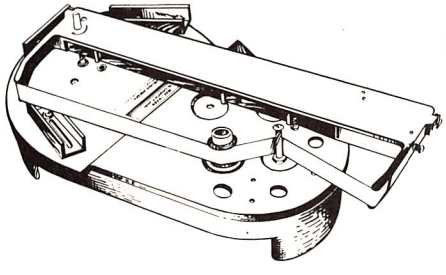
Sagem Radio Communications Equipment
122 Euston Rd,
Alexandria 2015 NSW
Phone: (02) 516 5399
Price: $1995

Telex-specialist Sagem has released a fax card which features the ability to send graphics and/or text direct from a word processing or desktop publishing application with the use of a hot key. The card works in background mode so that faxes can be converted, sent and received without exiting the current application. Using an internal, personalised telephone directory, the Xafax can transmit files up to 255



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YC/6/89

fax pages in length to 999 different numbers. An ASCII to bit-map conversion facility enables transmission of text files created with spreadsheets or word processors. An optional board, which mounts directly onto the Xafax, can be used to interface with 300/200 dpi scanners.

Take it Easy

Janson Computer Services
PO Box 397,
Dapto 2530 NSW
Phone: (042) 61 5451
Price: from $5000

Take it Easy is a pathology reporting and management system in four modules – word processing, payroll, cash book and the Reporting System. The Reporting module is designed so that only data entry is necessary. It can produce 16 different reports on a daily basis; these include biochemistry, bacteriology, glucose tolerance test, cytology, hematology and thyroid function test. Except for the word processor, the modules are written in Sculptor, a fourth generation language enabling the system to run under DOS, networks, various implementations of Unix and OS9.



Prescription for Success

Janson Computer Services
PO Box 397,
Dapto 2530 NSW
Phone: (042) 61 5451
Price: from $4000

Prescription for Success, designed for use by medical practitioners, is a single-practice management system. There are four modules to the system: word processing, payroll, cashbook and Recall, a practice-building and management system. Recall includes patient history, compensation, Medicare, Veterans Affairs, drug dosage and the ability to recall patients. Except for the word processor, the modules are written in Sculptor, a fourth generation language enabling the system to run under DOS, networks, various implementations of Unix and OS9.

Performance Advisor

Hyperdata Pty Ltd
4 Help St,
Chatswood 2067 NSW
Phone: (02) 411 1200
Price: $1995

Performance Advisor is a PC-based expert system written in Prolog designed to provide 'tuning' advice for MVS-based mainframes for both managers and analysts. While it can be used to train systems programmers, the package is intended for developing an in-house knowledge base to monitor MVS systems and customise the tuning expertise developed on the local system. It features windowed dialog boxes that show the system's diagnosis in one window and explanation of how diagnosis was reached in another; a separate window shows the recommended treatment to fix the problem.

Opal Laptop

ADE
2 Dublin St,
East Oakleigh 3166 Vic
Phone: (03) 543 2677
Price: from $4850

ADE has released two Opal Laptops, based on the 80286 microprocessor; both have a 640 *x* 400 pixel gas plasma display. The Laptop/1 has a 12MHz processor, while the Laptop/2 has a 16MHz processor. The /2 can be configured with either a 20 or 40Mb hard disk and is designed to withstand a shock of 10g while operating and 40 in non-operational mode.

LottoCheck

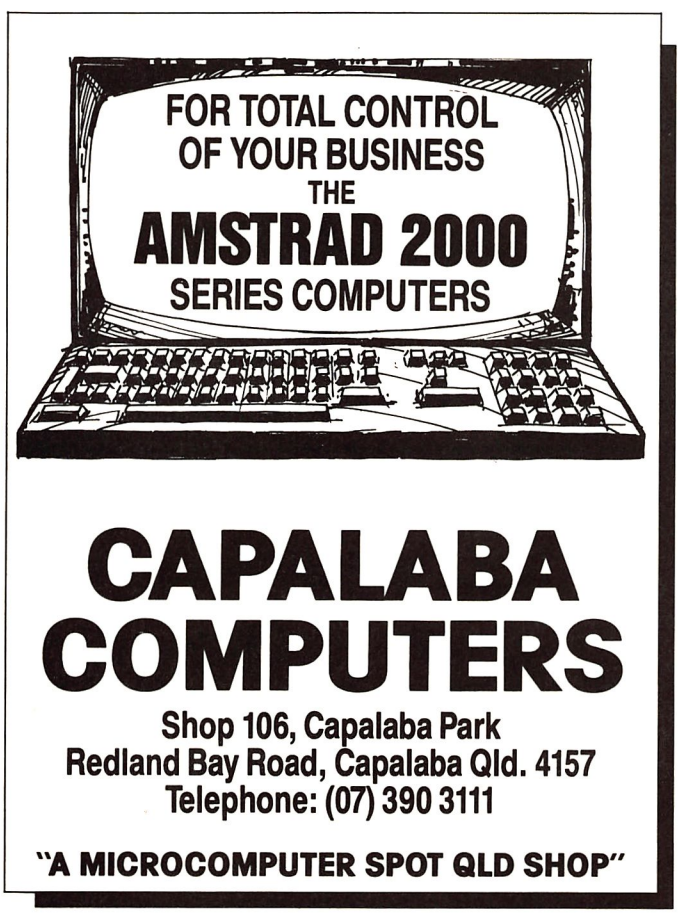
Solid Software
PO Box 218,
Belgrave 3160 Vic
Phone: (03) 754 4377
Price: $69 Lottocheck 6-44
$20 Upgrade

Solid Software has released an enhanced version of its popular LottoCheck program to cater for the change in Lotto from '6 from 40' to '6 from 44.' The new version also allows testing the database of past draws for System 18s (previously only up to System 15 could be tested) and allows for the new Second Chance draws, for which no supplementary number is drawn and for which only the First Division prize is paid.

Network Eye

Micro Support Systems
PO Box 21,
Crows Nest 2065 NSW
Phone: (02) 439 7773
Price: $364

Artisoft, developers of the inexpensive, NetBios-compatible LANtastic, have released a network manager for NetBios-compatible systems such as IBM Token ring, Arcnet, Ethernet, Novell and a range of other proprietary LANs. Claimed to give users capabilities for windowing, multiprocessing and multitasking similar to those available with OS/2's Presentation Manager, up to 32 remote computers can be monitored simultaneously. The program can be used either as a



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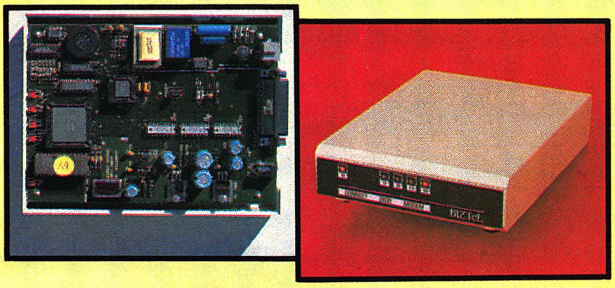
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Southern Pacific	(043) 314 9514

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Phone: (02) 821 1622
Price: $459 Allegro 2424SA; $299 Connect 2400



Following the new Hayes 2400 standards, two new 2400bps modems from BIZTel have no DIP switches. All parameters are set using the AT commands to duplicate the switch settings in software; they can then be saved in non-volatile RAM. Both models use the same VLSI chipset from Datasat, resulting in a package smaller than the base of a standard telephone. The light-weight, snap-shut case only has five status lights: Carrier Detect, Transmit Data, Receive Data, 2400bps and Power On. the two models are identical except that the Allegro includes Mirror III v1.0, a communications package featuring the optional CommPressor facility. CommPressor packs files before transfer, resulting in data transfers up to 6000bps between two systems running Mirror; the other difference is that the Allegro is supported with a two-year warranty and a one-year replacement policy, while the Connect is only covered by a 90-day limited warranty. Both units have a full range of features including automatic speed selection on connection and 2400-1200-300 fallback on poor connections, autodial, disconnect on timeout and autoanswer.

Mosaic 9600bps modem

Mosaic Electronics, 39 Neon St, Sumner Pk 4069 Qld
Phone: (02) 821 1622
Price: $3114



Based on the Rockwell chip set, this Hayes-compatible 9600-bps complies to both CCITT V32TCM (trellis-coded 9600 and 7200bps modulation) and V32QAM (quadrature amplitude modulation for 9600 and 4800bps) protocols as well as V22bis and Bell 212A. Full duplex communications are supported; other features include autoanswer, autodial, a choice of touch tone or pulse dial, automatic speed selection on connection and a 30mm, programmable speaker. The front panel has a full range of indicator lights: Modem Ready, Ring Indicator, High Speed, Off Hook, Transmit Ready, Carrier Detect, Ring Detect, Receive Data and Send Data.

Mosaic are also developing a speech encryption unit to prevent eavesdropping on telephone and radio communications (release is expected about mid-year).

TSR with the remote connection in the background or as a direct link to interact with other users on the network, to distribute computing tasks and otherwise manage network activities; other suggested applications are as a peripheral server and for interactive training. The Network Eye uses less than 25K of memory on the host and from 1 to 6K on remote terminals, depending on the video adapter installed.

CGA for the Amiga

Clear Technology
562 Gardeners Rd,
Alexandria 2015 NSW
Phone: (02) 317 5190
Price: $30

An adapter cable to allow the use of a Philips CM8833 CGA monitor, which features stereo sound, with the Commodore Amiga range, has been made available by Clear Technology. Intended as an alternative to Commodores' 1084 monophonic monitor, the CM8833 provides a 14-inch screen and a resolution of 600 *x* 285 pixels.

Logo Care

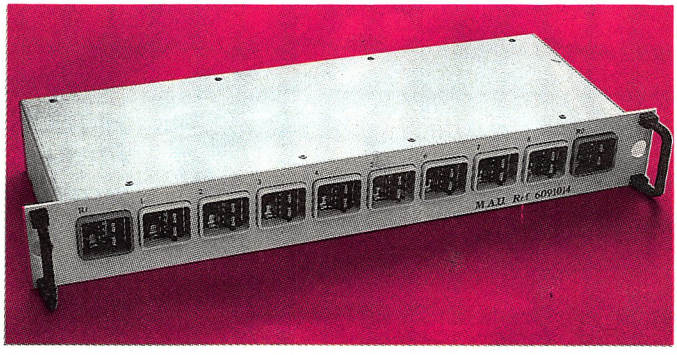
Logo Computer Services
303 Henry Lawson Centre,
Birkenhead Pt,
Drummoyne 2047 NSW
Phone: (02) 819 6811
Price: Not supplied

Version 3 of Logo Care (Cost and Resource Estimating) provides a method of producing, storing, retrieving and updating engineering estimates. All resources and activities formulae can be modified to suit particular requirements. Resources can be classified as labour, plant, material or fixed cost and the timebase can be set to any increment. Oncosts, contingencies and rounded total facilities are available and unit rates can be updated individually or be percentage changes. An evaluation disk is available (it's limited to five activities per estimate) from Logo for $10 plus $2 for post and handling.

Multi-station Access Unit

Acme Electronics
205 Middleborough Rd,
Box Hill 3128 Vic
Phone: (03) 890 0900
Price: Not supplied

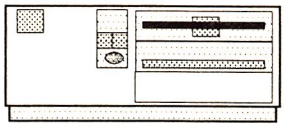
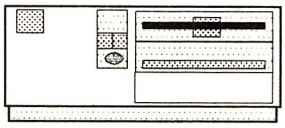
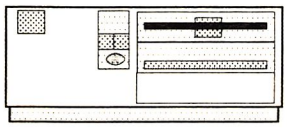
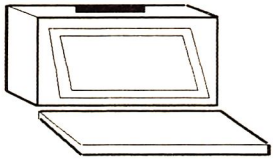
Acme's new multi-station access unit (MSAU) supports up to eight workstations in an IBM 8228 Token Ring and complies with the IEEE 802.5 standard. Phantom drive circuits, located in each attached workstation, allow stations to be added to the ring simply by connecting them to the MSAU; no external power is required for the unit. Several Acme MSAUs can be linked using connecting Ring In/Ring Out expansion ports. The unit can be either rack-mounted or enclosed.



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1.2M Floppy
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Battery backed clock
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40M H/D $3050

21M $2925 32M $3000

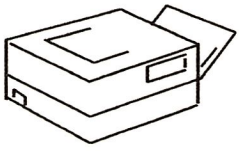


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File Server $3085
SANCOM AT / 42M HD
Ethernet / Monitor

Work Station $1670
SANCOM XT
Ethernet / Monitor

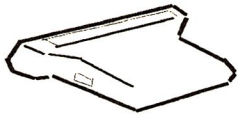
Novell Netware $ 750
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TIM HARTNELL



Helpful hints

DAVID PEDWELL from Dalby in Queensland has a PC1640 with EGA screen and 20Mb hard disk. He points out that if you have an EGA, and need to run a CGA program, you can do this by using the command DISPLAY CDCOLOR or CDMONO.

However, this does not always work. If you find it doesn't, the obvious (but undesirable) option is to change your dip switches at the back. Instead of doing that, you can try the command DISPLAY CGA. David tried this when running an older version of JET which he couldn't get to run under CDCOLOR, and it ran perfectly after entering DISPLAY CGA.

There is also a DISPLAY PLANT command which we assume gives Plantronics 320 *x* 200 16-colour resolution, although we haven't found many programs which use this mode. DISPLAY EGA will always reset the system to EGA, no matter which other DISPLAY command you've entered.

Hard disk hints

DAVID ALSO has a tip for hard disk users who wish to know the time, date and current directory when working with DOS. He suggests including the following PROMPT command in your AUTOEXEC.BAT file (in which the $h are backspaces to clean-up the time display):

```
PROMPT $d $t $h$h$h$h$h$h $_$p$g
```

When the .BAT file is activated, the display looks like this:

```
Tue 18-10-1989 22:07
```

Another idea. If you are in a low order sub-directory, such as:

```
works\files\demo
```

and you want to go from demo to files, the command CD.. will take you to the directory which is directly above the one you're in. This saves typing in:

You will find it hard to believe the difference this file makes.

```
cd\works\files
```

If you want to use the numeric keypad for number work in a spreadsheet, by triggering NUMLOCK, but then have to move the cursor around, you retrigger the arrow keys by using the shift key. This also works the other way around.

Finally, David has a great tip for you if the sound of your floppy drives in action is driving you even more crazy. There is a program FDQUIET.COM, which most Amstrad dealers have, which will make things much quieter. You will find it hard to believe the difference this file makes.

Binary numbers

THE TWO PROGRAMS shown here should help you strengthen your ideas on binary numbers. The first one, listed here (see the second line of the programs) as BINARY.BAS for the CPC machines, and BINARYPC.BAS for the PCs, will convert all the decimal numbers from 0 to 255 into their binary equivalents.

```
10 REM BINARY NUMBERS
20 REM BINARY.BAS
30 CLS:REM HOME on Apple
40 FOR b=0 TO 255
50 j=b
60 a$=""
70 FOR n=0 TO 7
80 t=j-INT(j/2)*2
90 IF t=0 THEN a$="0"+a$
100 IF t<>0 THEN a$="1"+a$
110 j=INT(j/2)
120 NEXT n
130 PRINT b,"   ";a$
140 NEXT b
```

```
'Binary Numbers
'rem BINARYPC.BAS
CLS
FOR b=0 TO 255
 j=b
 a$=""
  FOR n=0 TO 7
   t=j-INT(j/2)*2
   IF t=0 THEN a$="0"+a$
   IF t<>0 THEN a$="1"+a$
   j=INT(j/2)
  NEXT n
 PRINT b,"  ";a$
NEXT b
```

The second program will convert any base ten number you enter into binary, showing the task in action. When you run the program, you'll be asked to enter a (decimal) number, and the conversion will begin. You read the remainders the program generates from bottom to top to get the relevant binary number. The listings are headed (see second line of each listing of program two) TEN2BIN.BAS for the CPC machines, and TENBINPC.BAS for the PCs.

```
10 REM CONVERT BASE 10 TO BINARY
20 REM TEN2BIN.BAS
30 CLS:REM HOME on Apple
40 INPUT "ENTER YOUR BASE 10 NUMBER";n
50 t=INT(n/2)
60 PRINT "2 INTO";n;" =";t,
70 PRINT "REMAINDER";n-2*t
80 n=t
90 IF n>=1 THEN 50
```

```
'Convert base 10 to binary
'TENBINPC.BAS
CLS
INPUT "Enter your base 10 number";n
```

```
LABEL cycle
  t=INT(n/2)
  PRINT "2 into";n;" =";t;
  PRINT TAB(25);"Remainder";n-2*t
  n=t
IF n>=1 THEN GOTO cycle
```

Multiple drives?

PAUL HUNT from Brisbane says he has heard that it is possible, with a minor modification, to convert the PCW to log-on to four drives A:, B:, C: and D:. The comment came in an article in the British magazine *Amstrad PCW Magazine* (November '87), but Paul was unable to find any following issues in which the way to do this was revealed.

He writes: 'Does anyone know how to modify the PCW to log onto four independent disk drives? As far as I can determine, the PCW's disk drive controller chip (an NEC uPD 765AC-2) will handle four disk drives. Perhaps the BIOS will need patching.'

If you can solve this dilemma, please get in touch with me at *Your Computer*, or contact Paul directly. I'd also be interested in hearing from any companies making, or importing, software and/or hardware for any of the Amstrad computers. As well, I'd be more than happy to share any of your discoveries, hints, tips, comments and programs with other users, along with details of any Amstrad-specific user groups. A copy of my Amstrad PC Users Companion (disk and manual) will be given to anyone supplying PC hints which are used in this column. I have some CPC software to provide in return for CPC hints. Please write to Your Amstrad, Tim Hartnell, Your Computer, PO Box 227, Waterloo, NSW, 2015. □

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LARRY LEWIS



Are you still safe?

IN THE MARCH issue of *Your Computer* I mentioned that a number of bulletin boards had been broken into and that users should ensure they use separate passwords on each system. This provoked a number of responses such as 'why aren't these password files encrypted?' This came from those working in the mainframe and Unix areas.

From this point on I will use Unix as the example, this is not an indictment of its users, but it makes it simpler to explain. In place of Unix I could easily use the IBM mainframe MVS operating system, or the DEC VMS or whatever.

Unix is a multiuser operating system, its purpose in life is to provide services to users running on a typical multiple-access system. One of my friends runs Unix on NCR Towers with about 30 people logged on at each machine. This user access is typically based on some sort of fairly open system, often putting the user directly at the operating system prompt. Before the availability of security software, people basically had an open door to do almost anything they wished.

I remember programmers deleting others' datafiles, or worse, modifying files subtly to change values (or whatever). Because the system didn't protect against intrusion, you couldn't rely on your information being intact from second to the next. So, various security schemes were started: passworded log-ons, file-level protection (access restrictions) and audit trails (on important files).

This solved a lot of problems, but then people with high access levels could still get in and look at the password file, get your password, log on and damage things (don't laugh – it still happens). As a result of this exposure most security systems went to an encryption scheme for passwords. Some are one-way encryptions where you cannot (theoretically) deduce the password from the encrypted one (when you log on, the password you enter is encrypted and compared with the authorised one), others use an encryption scheme where the key used to encrypt the password is variable based on certain values. No matter what the scheme is, the intent is to stop people who have legitimate rights to access the security file, from viewing the passworded data.

As you can see the high levels of security and access control are required mainly because people who use the system have a generally high level of access to the data contained within the systems. It was suggested that bulletin boards should have exactly the same style of security.

Do bulletin boards grant this sort of access? Leaving aside the RCP/M-style systems, most bulletin boards do not permit access to the operating system, whether it is DOS, PC-MOS, Unix or whatever. The idea of a BBS is to provide Message Bases, File Transfer, Chat facilities and so on.

Also, bulletin boards are (once again generally) run as a hobby; the software that typically runs a BBS has been written by another operator and is usually public domain; others are purchased (like TBBS). None of these have the suggested security or provide the source code for the software.

The solution – to fix the security holes that are found. Users must be more security-aware, use different passwords and simply exercise a bit of common sense. More importantly, some operators need to take the matter of protecting their users much more seriously and cut out this 'we are amateur so that means we can't have a professional attitude' malaise. Yes, bulletin boards are run by amateurs, but sometimes (as with sport, for example) the amateurs have much higher standards and more ability than the so called professionals.

Primary electronic collection points

ACT – PC Exchange RIBM (062) 58-1406
NSW – Prophet TBBS (02) 628-5222
Vic. – Custom Programming Opus (03) 848-3331
Qld. – AMPAK Opus/PRBBS (07) 263-7070
SA – Oracle PC-Network (08) 260-6222
WA – Nemo Multiple BBS RAPL (09) 370-1855
Tas. – Hobart Users Bulletin Board (002) 43-5041

PAMS Listing 8904

QUEENSLAND

Access North Queensland
Phone: (070) 51-0566
Baud: V21 V22 V23
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: CMVideoTeX

AMPAK Opus/PRBBS
Sysop: Brian Wendt & John Bews
Phone: (07) 263-7070
FIDOnet: 3:640/205
Baud: V21 V22 V22bis V23 B103 B212
Access: Mem Reg
Computer: Sanyo 16 Plus 286
DOS: MS DOS
BBSoftware: Opus
Note: 144.90 Mhz VK4KJB-1 1200 bps Amateur Packet Radio

Apple-Q Node 1
Sysop: Graham Black & Vince Crosdale
Phone: (07) 284-6145
Baud: V21 V22 V22bis V23
Access: Mem
Computer: Apple //e
BBSoftware: GBBS PRO

BaudWalk BBS
Sysop: Geoff Ryan
Phone: (07) 285-5814
Baud: V21 V22 V22bis V23 B103 B212
DOS: PC DOS
BBSoftware: Focus

Brisbane MicroBee User Group
Sysop: Graham Scott
Phone: (07) 366-4833
Access: Mem VA

BrisBug
Sysop: Ron Lewis
Phone: (07) 841-1768
FIDOnet: 3:640/801
Baud: V21 V22 V22bis V23 PEP

Commodore Computer Users Group Qld
Sysop: Greg Shea
Phone: (07) 344-1833
FIDOnet: 3:640/304
Baud: V21 V22 V22bis V23
Access: Mem VA
Computer: President 200e XT
BBSoftware: Opus

Comtel BBS
Sysop: Warren Mason
Phone: (077) 89-1655
Baud: V21 V22 V22bis V23 B103 B212
Access: Mem VA
Computer: Commodore 64
DOS: Basic IEEE
BBSoftware: Comtel

Educational RBBS
Sysop: Andrew Waddell
Phone: (07) 266-3369
Baud: V21 V22 V22bis V23
Access: Mem VA
Computer: IBM XT clone
BBSoftware: Mailbox
Note: USERWORKS Node ?1

Electric Dreams BBS
Sysop: Joe Altoff
Phone: (07) 399-1322
Baud: V21 V22 V23
Access: Mem VA
Note: User Works Node ? 5

Excalibur BBS / The Missing Lynx
Sysop: Andrew Johnston
Phone: (077) 79-5959
FIDOnet: 3:640/220
Baud: V21 V22 V22bis B212 PEP
Access: Public
Hours: Weekdays: 1500 – 0800
Weekends: 24 Hours

Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus / Lynx

FAR-NOR-64 BBS
Sysop: Ian Pearse
Phone: (070) 54-6892
Baud: V21 V22 V23 B103 B212
Access: Mem Reg LVA
Computer: C-64
DOS: BASIC IEEE
BBSoftware: BBS64

Grammar BBS
Sysop: Barry Taylor
Phone: (077) 72-6052
FIDOnet: 3:640/702
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Greenhorn Experimental
Sysop: Mike Richardson
Phone: (07) 208-2640
FIDOnet: 3:640/301
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: SKAI 286
DOS: MS DOS
BBSoftware: QuickBBS

Gumtree?BBS
Sysop: Peter Brewer
Phone: (075) 63-2621
FIDOnet: 3:640/601
Baud: V22 V22bis
Access: Mem Reg
Hours: Weekdays: 2100 – 0800
Weekends: 24 Hours
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Hi-Tech CBBS
Sysop: Clyde Smith-Stubbs
Phone: (07) 300-5235
Baud: V21 V22 V23

JabberWOCky
Sysop: David Drummond & Peter Lane-Collett
Phone: (07) 398-4288
FIDOnet: 3:640/304
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: Imagineering XT
DOS: MS DOS
BBSoftware: Opus

Kangaroo Point TAFE
Sysop: Nigel Roulston
Phone: (07) 393-1763
Baud: V21 V22
BBSoftware: GTPower

Listline Experimental
Phone: (07) 353-3718
Baud: V21 V23

Mackay High School BBS
Sysop: Bob Chalmers
Phone: (079) 51-4815
Access: Public
Hours: Weekdays: 1600 – 0730
Weekends: 24 Hours

Marlin-Coast BBS
Sysop: Ray Chalmers
Phone: (070) 57-7658
FIDOnet: 3:640/501
Baud: V22 V22bis B103 PEP
Access: Reg VA
Computer: Clevland 286
BBSoftware: Opus

Missing Link BBS
Sysop: Mike Barber
Phone: (07) 808-3094
Baud: V21 V22 V23
Access: Reg
Computer: C-64
BBSoftware: Punter

NQ Connection
Sysop: Geoff Gordon
Phone: (077) 79-7660
FIDOnet: 3:640/710
Baud: V22 V22bis PEP
Access: Reg VA
Computer: Kaypro XT
DOS: MS DOS
BBSoftware: Opus

Phoenix BBS
Sysop: Kelvin Saggers
Phone: (07) 800-4660
Baud: V21 V22 V22bis V23
Access: Mem

Redcliffe Library
Sysop: Andrew Osborne
Phone: (07) 283-0315
FIDOnet: 3:640/203
Baud: V21 V22 V22bis V23
Access: Reg VA
Hours: Weekdays: 1700 – 0800
Weekends: 24 Hours
Computer: IBM Clone
BBSoftware: Fido

Rock Cave BBS
Sysop: Rick Dalley
Phone: (07) 395-1809
Access: Mem VA
Note: User Works Node ? 4

Sidecar Express BBS
Sysop: Brendan Pratt
Phone: (075) 46-3252
Baud: V21 V22 V22bis V23 B103 B212
Access: Mem Reg
Computer: Amiga Sidecar
DOS: MS DOS
BBSoftware: Focus
Note: User works node 7

Software 80 BBS
Sysop: Tony Melius
Phone: (07) 369-7103
Baud: V21
Access: Reg VA
Hours: Weekdays: 1930 – 0800
Sat 1430 – Mon 0800

Stanley's Place
Sysop: John Wain
Phone: (07) 264-4747
FIDOnet: 3:640/212
Baud: V21 V22 V22bis
Access: Reg VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Sunshine Coast Connection
Sysop: Brian Boseley
Phone: (071) 44-2889
FIDOnet: 3:640/401
Baud: V21 V22 V22bis V23
Access: Public
Hours: Mon – Sat: 2000 – 0800
Sun: 24 Hours
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: Opus

Swiss Connection
Sysop: Andrew Osborne
Phone: (07) 283-0314
FIDOnet: 3:640/204
Baud: V21 V22 V22bis V23
Computer: IBM AT

The Galaxy GateWay Computer System
Sysop: James Collins
Phone: (07) 207-8900
FIDOnet: 3:640/230
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Lynx

Toowoomba RBBS
Sysop: Chris White
Phone: (076) 30-1762
Baud: V21
Access: Mem Reg LVA
Hours: Daily: 2100 to 0630
Computer: C-128

Townsville Apple Bulletin Board
Sysop: Christopher Griggs
Phone: (077) 73-3651
Baud: V21 V22 V23 B103 B212
Access: Mem Reg LVA
Computer: Apple //e
DOS: ProDOS
BBSoftware: GBBS

Transcendental Connection
Sysop: Kenneth Page
Phone: (07) 281-9418
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: C-64
BBSoftware: BBS64

Youth Extension Service (Toowoomba)
Sysop: Wayne Bucklar
Phone: (076) 39-1790
FIDOnet: 3:640/302
Baud: V21 V23
Access: Public
Computer: Sperry
DOS: MS DOS
BBSoftware: Opus

SOUTH AUSTRALIA

ADelaide AMiga (ADAM) TBBS
Sysop: Greg Hicks
Phone: (08) 370-5775
FIDOnet: 3:680/805
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM AT
DOS: MS DOS
BBSoftware: PC Board

Aquarium BBS
Sysop: Bream LeFish / Martin Sandiford
Phone: (08) 270-4341
FIDOnet: 3:680/807
Baud: V21 V22 V22bis V23
Access: Mem Reg VA
Computer: PC230
DOS: MS DOS
BBSoftware: Custom (Aquarium)

Coffee Time BBS
Sysop: Terry Mulvaney
Phone: (08) 254-9423
FIDOnet: 3:681/860
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Computer Talk
Sysop: Bruce Kelly
Phone: (08) 326-2354
FIDOnet: 3:680/816
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

Elite BBS
Sysop: Andrew Gleave
Phone: (08) 337-6115
Baud: V21 V22 V22bis V23
Access: Reg VA
Hours: Daily: 2000 – 2300
Computer: Amiga 500
DOS: AmigaDOS
BBSoftware: BBS-PC!

Multiple System BBS
Sysop: Danny Vozzo
Phone: (08) 255-5116
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: Apple //+
DOS: Apple DOS
BBSoftware: GBBS

Nexus Education Dept BBS
Phone: (08) 243-2477
Baud: V21
Access: Mem

Oracle PC-Network
Sysop: Don Crago & Grayham Smith
Phone: (08) 260-6222
FIDOnet: 3:680/804
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: TBBS

Phone Box BBS
Sysop: Darryl Merritt
Phone: (08) 380-5505
FIDOnet: 3:681/854
Baud: V21 V22 V22bis V23
Access: Public
Computer: Mitec

DOS: MS DOS
BBSoftware: Opus
S A C BBS
Sysop: Austen Evans
Phone: (08) 387-0249
Baud: V21 V22 V23 V23ORG B103 B212
Access: Mem LVA
Computer: C-128
BBSoftware: Blue Board
SA Country CBCS
Sysop: Martin Crockett
Phone: (085) 22-4434
FIDOnet: 3:681/853
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus
Sorcerer Users Group BBS
Sysop: Steve Fraser
Phone: (08) 260-6576
Baud: V21
Access: Mem LVA
Computer: Pulsar LBB
DOS: CP/M
BBSoftware: ROS
The Bureau BBS
Sysop: Patrick Browne
Phone: (08) 258-1466
FIDOnet: 3:681/855
Baud: V22 V22bis
Access: Reg VA
Computer: Kaypro XT
DOS: MS DOS
BBSoftware: Opus
The Daily Planet
Sysop: Rick Morris
Phone: (08) 231-2053
FIDOnet: 3:680/802
Baud: V21 V22 V22bis V23
Access: Reg
Computer: IBM AT Clone
BBSoftware: Opus
The Key Board
Sysop: Paul Lawrence
Phone: (08) 344-5354
FIDOnet: 3:680/814
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM Clone
DOS: MS DOS
BBSoftware: Opus
Trivia BBS
Sysop: Daron Ryan
Phone: (08) 377-0049
Baud: V21 V22 V22bis V23
Hours: Weekdays: 1800 – 0800
Weekends: 24 Hours
DOS: MS DOS
BBSoftware: QBBS

WESTERN AUSTRALIA

Atari Apex BBS
Sysop: Andrew Waite
Phone: (09) 451-7288
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: Atari ST
BBSoftware: FoRem ST
Computex BBS
Sysop: Russell Stokes
Phone: (09) 447-0522
Access: Reg VA
Gamma Istari
Sysop: Richard Dale
Phone: (09) 493-1534
FIDOnet: 3:690/626
Baud: V21 V22 V22bis V23 B103 B212
Access: Mem LVA
Computer: IBM AT
DOS: MS DOS
BBSoftware: Opus
Hedland's First Bulletin Board
Sysop: Wayne Wessling
Phone: (091) 73-2275

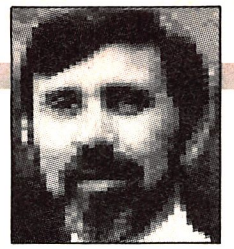
Complete PAMS Listing

THIS MONTH we are publishing the final third of the complete National PAMS Listing. It has appeared in three parts, and not two as initially stated, due to space limitations.

FIDOnet: 3:690/622
Baud: V21 V22 V22bis V23
Access: Reg
Computer: Epson PC+
DOS: MS DOS
BBSoftware: Opus
Kalgoorlie College RCP/M
Sysop: Graham Clark
Phone: (090) 21-7755
Baud: V21 V22 V22bis V23
Access: Reg VA
Kardinya Turbo BBS
Sysop: Tony Salmeri
Phone: (09) 331-1695
Baud: V21 V22 V22bis V23 B103 B212
Access: Reg LVA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Turbo BBS
Lightning BBS Line 1
Sysop: Simon Blears
Phone: (09) 275-8225
FIDOnet: 3:690/601
Baud: V22 V22bis B212 PEP
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus
Mini Omen
Sysop: Greg Watkins
Phone: (09) 279-8555
Baud: V21 V22 V23
Access: Public
Computer: TRS-80
DOS: NewDos
BBSoftware: Omen
Murdoch University ES-BBS1
Sysop: Roger Atkinson
Phone: (09) 332-2604
Baud: V21
Access: Mem VA
Computer: Commodore 128D
DOS: CP/M
BBSoftware: Turbo BBS
Nemo Games Machine
Sysop: Graeme Platt
Phone: (09) 370-2666
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: Apple //e
DOS: ProDOS
BBSoftware: GBBS Pro
Nemo Multiple BBS RAPL
Sysop: Graeme Platt
Phone: (09) 370-1855
Baud: V21 V22 V22bis V23
Oasis ST BBS
Sysop: Lou Schillaci
Phone: (09) 430-5431
Baud: V21 V22
Access: Mem LVA
Hours: Mon – Sat: 1800 – 0800
Sun: 24 Hours
Computer: Atari
DOS: TOS
BBSoftware: Michtron
Paragon Computers BBS
Sysop: Paul Reeves Steve Quartely Chris Parker
Phone: (09) 325-5160
Baud: V21 V22 V22bis V23
Access: Public
Computer: Atari ST
DOS: Gem
BBSoftware: Michtron
Pegasus Entertainment System
Sysop: Michael Russell & John Chin
Phone: (09) 344-8025
FIDOnet: 3:690/621
Baud: V21 V22 V22bis V23
Access: Public
Computer: Epson AX
DOS: MS DOS
BBSoftware: QuickBBS
Perth Omen
Sysop: Mark Dignam
Phone: (09) 244-2111
Baud: V21 V22 V22bis V23 V23ORG
Access: Mem Reg
Computer: TRS-80
DOS: NewDOS
BBSoftware: Omen TRBBS
Student Access Message Service
Sysop: Peter Walton & John Bramley
Phone: (09) 321-9721
Baud: V21 V22 V23
Access: Reg VA
Terminal BBS
Sysop: Andrew Milner
Phone: (09) 389-8048
FIDOnet: 3:690/625
Baud: V21 V22 V22bis V23 B103 B212
Access: Public
The Gas Station
Sysop: Don Hill
Phone: (091) 82-2469
FIDOnet: 3:690/624
Baud: V21 V22 V22bis V23
Access: Public
Hours: Weekdays: 1700 – 0630
Weekends: 24 Hours
Computer: NEC PowerMate I
DOS: MS DOS
BBSoftware: Opus
The Gathering BBS
Sysop: Ken Peters
Phone: (09) 272-4711
FIDOnet: 3:690/630
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: Opus
The Perth Hotel
Sysop: Rod Evans
Phone: (09) 325-4752
FIDOnet: 3:690/612
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: Opus
Treasure Island
Sysop: Gloria Platt
Phone: (09) 271-0471
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: Apple //e
DOS: ProDOS
BBSoftware: GBBS Pro
West-Gate BBS
Sysop: Phil van Leen
Phone: (09) 481-0489
FIDOnet: 3:690/611
Baud: V21 V22 V22bis V23 B103 B212
Access: Reg VA
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: Opus
Z-Node 62
Sysop: Lindsay Allen
Phone: (09) 450-0200
Baud: V21 V22 V22bis V23
Access: Public
Computer: BigBoard II
DOS: ZCPR
BBSoftware: Z-MSG


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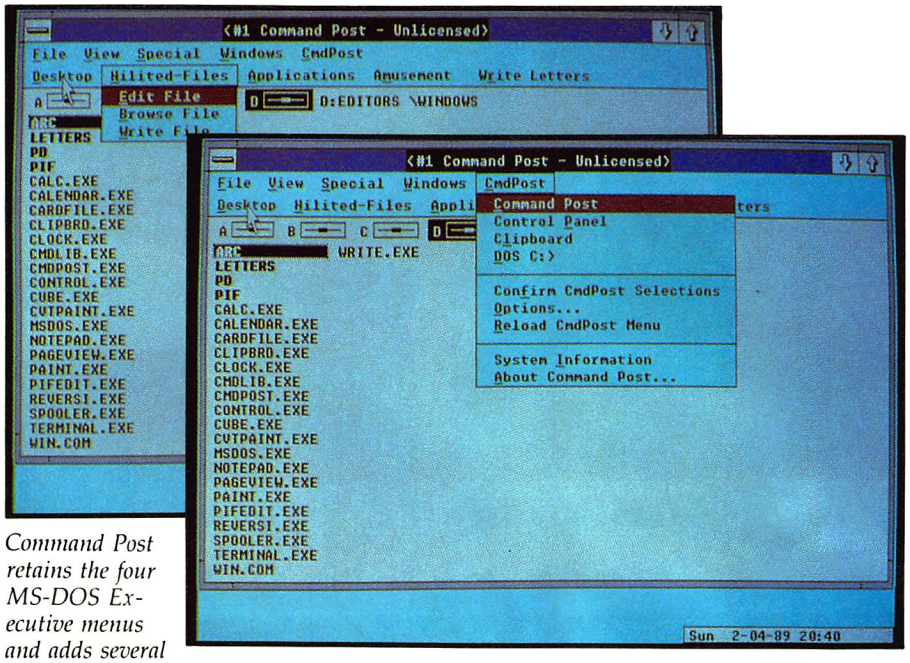
JOHN HEPWORTH



Shareware for Windows

MICROSOFT WINDOWS has been with us for some time now, providing a device-independent graphics environment for programs like PageMaker and other applications. As well as the commercial applications for Windows, there are some vital programs being distributed as either shareware or public domain software. It's time for a quick report on some of the more common ones.

The three top shareware Windows applications all come from the same company, Wilson WindowWare. All three are vital utilities for anyone using Windows for any purpose. Command Post enhances the Windows user interface and facilitates user-defined menus. Browser allows the user to scroll through a text file. Applets is a collection of small utility programs which are called from Command Post or other applications and allow easy file and disk management. In addition, there are other useful applications and trinkets from various companies.



Command Post retains the four MS-DOS Executive menus and adds several additional ones – two (Windows and CmdPost) of them are part of the CMDPOST.EXE program itself, while the others are user-defined.

Command Post

MICROSOFT Windows might be a device-independent graphics environment, but when starting Windows the first thing to be seen is a screen called the MS-DOS Executive containing a list of filenames. These have no comments or explanations, and there are no icons or menus for the various applications – OK for the expert, confusing for the novice. Command Post enhances this by creating a menu system for some internal Windows functions, and for user applications.

Command Post hides the MS-DOS Executive window, and replaces it with its own window. It has the same general appearance as the MS-DOS Executive, with standard scroll bars, title bars and other paraphernalia. The difference comes with the menus.

The MS-DOS Executive allows four menus to be pulled down. These are the File, View and Special menus plus the one called the Control-menu box (the one at the top left that looks a bit like a letter box). Command Post retains those four, with a very minor change to the Control-box menu, and adds several additional ones – two of them are part of the CMDPOST.EXE program itself, while the others are user-defined.

Command Post enhances this by creating a menu system for some internal Windows functions, and for user applications.

The first two menus are titled Windows and CmdPost. The Windows menu allows all open windows to be rearranged quickly and easily. They can be stacked one on front of another, offset a little so the edges of the ones at the back can be seen. They can be arranged in rows or columns with a single click. Also shown on the Windows menus are the names of any open windows, and the name of any datafile being processed by a program in a window.

The user-defined menus are created by editing an existing ASCII file called CMDPOST.MNU. The menus can give messages to the user, and can prompt for responses like the name of a file to be edited. When Command Post starts, it looks for this file and loads the menu defined in it. A sample CMDPOST.MNU file comes with the package. It is fully commented and with minimal reference to the manual is easy to modify. The sample CMDPOST.MNU has five user-definable menus, any one of which can be altered or deleted, while creation of additional menus is easy.

Command Post can be started manually from the MS-DOS Executive window. It can also be started automatically every time that Windows itself is started. All its takes is a simple edit of the WIN.INI file that Windows reads when it starts.

Command Post allows the user to run almost any Windows application by clicking on a menu entry, and makes editing menus truly simple. Vital for any Windows user.

Browser

IN APRIL, I mentioned the renowned LIST program, which is able to read through a file and display it on screen – a sort of

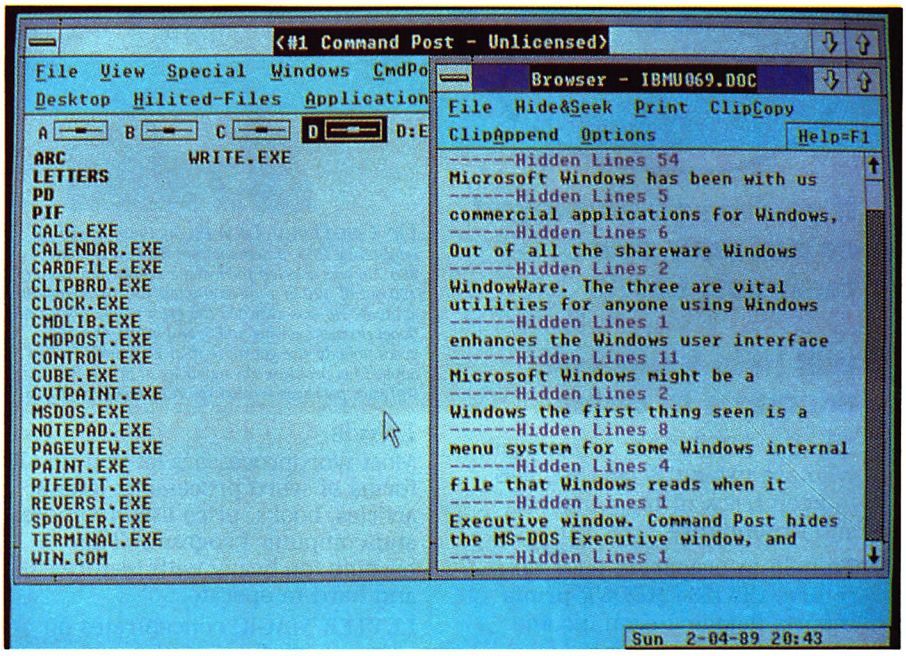
'read-only' word processor. Browser serves a similar purpose within the Windows environment to that performed by LIST directly under DOS.

Browser can open a file, reload the existing file or delete a file after confirmation. It can display a file's statistics like its size in bytes, output format, number of lines, length of lines and creation date and time.

Browser's search option is titled Hide&Seek. It is far more than just a search – it can look for a string of up to 32 characters and highlights the line containing it. A repeat search for the same string further down the file is possible. It's also possible to show all lines, hide all lines and to show and/or hide lines containing a user-defined string. As many different search criteria can be active simultaneously, this is a neat way of searching a free-form ASCII file for data.

Browser can print the whole file, or selected parts of it. Marked blocks can be printed, or just the un-hidden lines can be printed. The whole file, or marked blocks and/or un-hidden lines, can be copied to the Windows Clipboard, and can be appended to the existing Clipboard contents, or can overwrite them. From the Clipboard, naturally, it can be pasted into Windows Write and then saved to disk. A flexible way to find snippets of data, select them and write to another file.

Browser's display can be set to suit any taste: ANSI or ASCII text, hex or WordStar; tabs can be expanded or left untouched, and lines can be wrapped at the screen edge, or just extend beyond the frame.



Amongst its other features, Browser can display a file's statistics. The program has a powerful search option titled Hide&Seek, which is far more than just a search – it can look for a string of up to 32 characters ('Window' in the example here) and highlights the line containing it and hides all others.

Applets

WINDOWS can be used as an environment for major applications like PageMaker, but there are many minor tasks that have to be done – files have to be copied, renamed, moved and deleted, and Windows often need to be moved to other locations. If multiple windows are on screen they may have to be stacked, or arranged in rows or columns. Windows have to be closed, turned into an icon, zoomed, hidden or shown again. All of these can be done manually, but at times it would be nice to able to expand the Command Post menus to handle the tasks. Applets consists of 16 small programs which can be called from a Command Post menu, with the user being prompted for any response or file name required.

In each case the filename starts with one or two curly brackets so that in a sorted directory listing they are all kept together and away from other programs names. }}RUN1ST.EXE is the engine for all the others while }COPY.EXE copies files and }MOVE.EXE moves them from directory to directory; }RENAME.EXE and }DELETE.EXE rename or delete files; and }PLACE.EXE places a window at a particular screen location. }ARRANGE.EXE arranges or stacks all open windows and }CLOSE.EXE closes a window and quits the program in it, while }ICONIZE.EXE converts a window to an icon. }ZOOM.EXE zooms a window to full size and }HIDE.EXE hides it; }SHOW.EXE shows it again. WININFO.EXE reads window parameters so that the correct parameters can be specified when writing the menu file; }BEEP.EXE beeps once and }SAY.EXE puts a short message on the screen; }SAYBEEP.EXE beeps and then puts up a short message.

Browser can open a file, reload the existing file or delete a file after confirmation. It can display a file's statistics like its size in bytes, output format, number of lines, length of lines and creation date and time.

Wilson WindowWare

COMMAND POST version 5.2 is distributed in CMDP52.EXE, Browser version 3.1 is in BROW31.EXE and Applets version 1.1 is in APLT11.EXE. All three are distributed as self-unpacking archives, which are expanded into their component files simply by running them. Each consists of several files, including the relevant executable files and a file containing the full manual. All of the programs are fully functional.

Wilson WindowWare is at 3377 59th SW, Seattle WA 98116. Very modest fees are requested to register any one of their three programs – registration is only $20 per program. The latest disk for any one program is $US5 and the printed manual for one program is $US10.

Reserve grade

THERE ARE some programs from other



If you're self-employed or run your own business, Lewis CROSS-CHEQUE will help keep your accounts in order.

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Dr Geoffrey Lewis. *In 1965 he was selected by IBM to demonstrate the new System 360. He was selected following a sensational score of 150 out of 120 in a university test for mathematical aptitude. He was awarded the extra points for exceptional problem solving ability and in the next ten years nobody else got more than 75 marks. He has applied his problem solving ability in producing four software packages written for Australian conditions.*

Lewis LETTER MAGIC

Most wordprocessors let you do all forms of word processing: letters, articles, books, price lists, footnotes and computer programs. They become top-heavy with features and hard to operate.

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LETTER MAGIC has a database for names, addresses and other information. You can send the same letter to many names. You can produce address labels, telephone lists, fees due notices.

"If your primary need for a wordprocessor is letter writing, then Letter Magic is worth your attention, regardless of the word processor you are currently using." Ewart Stronach, Your Computer, December 1987.

DEMO PACKS

Demo packs, which contain the manual and complete program are available at only a fraction of the price. Not just a fancy scrolling display with impressive graphics but the real program. Actually test it out on your own computer! If you like the program you pay the balance of the price.

The programs are available for MS/DOS. Available for Macintosh except LETTER MAGIC.

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PAY-PACK does all aspects of your pay processing: pay slips, tax calculations, holiday and sick accruals, management reports, group certificates. PAY-PACK is used by over 800 firms, ranging in size from companies with three employees through to BHP.

Over fifty new features have been added to PAY-PACK in Version 4, including:

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- Rostered Day Off accruals;
- Tax averaging for sales commissions.

There are also extra options for:

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companies which are worthy of brief mention, even though space prohibits a full review. In general they are shareware, with various authors and registration requirements –

JUMP11.ARC contains a little program called DISKJUMP.EXE. This displays on screen a visual 'tree' of the disk, with all the names of the subdirectories shown. A mouse can be used to scroll down through the tree, and pressing the right mouse button starts a new copy of the MS-DOS Executive in the selected directory.

EASEL35.ARC reads and writes bit-mapped graphics files in Windows Paint, PC Paintbrush, GIF and MacPaint formats and can convert from one format to another. It also allows the image to be stretched or shrunk in either height or width.

DUMPMSP.EXE, in MSW.ARC, dumps Windows screen images to disk in a format which can be loaded into Windows Paint. Combined with Easel this gives a way to take Windows screen images into a variety of applications, including desktop publishing packages.

Windows can be used as an environment for major applications like PageMaker, but there are many minor tasks that have to be done – files have to be copied, renamed, removed or deleted, and Windows often have to be moved.

XVT-DRAW.EXE, in XVTDR104.ARC, is an interesting low-end CAD package. It does make it easy to quickly create simple line drawings, which print out quite well even on dot matrix printers. XVT-DRAW has the disadvantage of having no printed manual and relys on extensive help screens, but finding one's way around it is not hard.

There are others to look for – HP-CALC-.EXE in HP-CALC.ARC puts a Hewlett-Packard compatible 'calculator' on screen. FREEMEM.ARC merely creates an icon that shows the amount of free memory. SYSGRF.ARC shows a constantly changing graph of system activity (yawn). TICTAC3D.ARC is three-dimensional noughts-and-crosses. TIME.ARC puts a digital clock on screen. TUNER.ARC is a demonstration program, with source code, of ways to change the colours on a Windows screen. VIEW.ARC is another file browser. WINMAZE.ARC demonstrates Dynamic Data Exchange between windows. WINQVT.ARC is a VT220 terminal emulation. WINDOWS.ARC has an assortment of amusements.

All of the above programs are available from most good bulletin boards, including the Sydney PC User Group bulletin board on (02) 724 6813. Get copies, enjoy them, but don't forget to register! □

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STEWART FIST



Far-out print-out!

If you haven't done a printer set-up before, it's worthwhile spending half an hour playing around with the program just to feel comfortable with the way the system works.

APPLEWORKS USERS seem to have a perennial problem with customising printers – I'm talking here about the old versions of the real AppleWorks not the pseudo-AppleWorks IIGS version.

I must admit the whole idea of customising my program to do strange and wonderful things with my printer hasn't really been on the top of my list of priorities, but that's mainly because I've got a Macintosh whenever I want to get into desktop publishing-type ventures. But not everyone has, hence the number of phone calls and letters I get about jazzing-up the standard AppleWorks output.

It must be frustrating to open up the printing options every day and see Characters per Inch, Boldface, Superscript and Subscript in front of you and not be able to use them, so let's see if we can make a quite complicated subject understandable.

First of all, there are four links in the chain between your words on the screen and your words printed on paper: the AppleWorks program, the computer hardware, the printer-interface card, and the printer itself.

All of these four have a measure of intelligence; all of them can take and change the stream of bits and bytes that constitute both the print characters, and the control signals.

All the normal range of print characters (A-Z, a-z, 0-9, plus the full stop, backslash, question mark and shifted numeric characters are all part of the international ASCII set, which means that whenever your computer puts out these codes, the printer should print the correct characters unless it was designed by Eskimos on a bad day.

The ASCII set also has agreement on the character used for the space, carriage return (the end-of-line character), line feed (the shift-to-next-line character) and delete (destructive backspace). There are also other control characters in the list (Ctrl-A for instance) which are non-print characters and often have some de facto standardisation – they are commonly used to perform special functions.

Where non-technical computer users fly into panic with ASCII, is that all these standards can be expressed in a few quite different (and confusing) ways. The capital A character which is made by hitting Shift-A on the keyboard has a decimal value of 65. But the computer doesn't deal with decimals at the bottom level, so Shift-A also has a Binary value of 01000001 which is how the computer sees it.

Since programmers have trouble with long binary numbers and tend to make mistakes, at the machine programming level Shift-A will be treated as a hexadecimal (base-16) number $41 (the dollar sign means that it is a hex number). These are all the same thing in different notations – capital A on the screen, is Shift-A on the keyboard, is decimal 65 on the list, is hex $41 for the programmer, which is 01000001 as far as the electrical charges in computer memory are concerned.

OK, lecture over. With AppleWorks we only need to know that both print and non-print characters have a decimal value. You find out what these values are, as does everyone, by looking-up an ASCII chart. They are in the appendixes of most programming-type books – or you could copy the chart in the new tutorial 'Start Computing', in this issue and keep it handy.

To set-up a printer you choose the Other Activities menu, then the Specify Information About Your Printer/s selection. At the top of this page is '1. Open-Apple-H printer' which simply lets you select which one of the three possible printer set-ups is used when you use the Open-Apple-H from within AppleWorks. A lot of people don't realise this command lets them print everything on the screen instantly – it is a screen-dump facility which is very handy for printing out disk directories. Keep a copy of each directory with your old data disks and it'll save you hours of searching.

AppleWorks only allows you to have one of the three selections as a custom printer (where you specify the commands to perform every function yourself) – the other two must be taken from the list provided, and they will then use the default values pre-set by the program. If you have a model of printer that doesn't appear on this list, try the Epson series and if those don't work, step through the entire list one at a time and test them out. One should eventually work 'near enough', either that, or you'll be forced to customise from scratch.

One trap here – the interface card must be set-up correctly before you try any printer out, so get out your manual.

Although you can have three printers specified in AppleWorks, this doesn't mean that you can only use these options with three different pieces of hardware. You often use all three options with the one printer; one to specify the Draft printing mode, another the High Quality mode, and the third for special purposes – say with a different language character set, or to print everything in italics.

If your printer is on the list then you are lucky; you can use this for one of the set-ups (say for the draft mode) and then use the Custom Printer in a second selection for the Near Letter Quality Mode. You can only get a third bite of the cherry by altering the bytes on the disk to customise one or more of the standard set-ups which are contained in the file Seg.PR on the disk – but I won't go into that now.

Of course you can use all three selections with different pieces of hardware if you wish, as long as you've got three different interface cards in three different slots, and at least two of the printers are

selectable from the list within AppleWorks.

If you haven't done a printer set-up before, it's worthwhile spending half an hour playing around with the program just to feel comfortable with the way the system works. Before you do, however, make a copy of your current AppleWorks disks and use those for experimentation.

At the Printer Information menu level (using your copy) remove any custom printer already in place, and then select Add a Printer. This takes you to a menu with the current list of popular printers, and at the end is the Custom Printer option. Choose this one, and you'll be asked to name it – call it FRED.

The set-up program will now want to know which slot your printer interface card is in, and that's usually Slot 1, but it could be elsewhere if someone's been playing around. Always leave it in Slot 1 if you can, this is the de facto standard for Apple.

Notice at the bottom of this list is a selection 'Print onto disk or on another Apple'. This allows you to customise a virtual printer, where you don't print to hardware but out through a cable (from a Super Serial Card) into another computer without needing a communications program in your Apple.

When you have chosen the slot you are in, the Change a Printer menu will present a list of selections that you should be familiar with if you often swap from cut paper to fan-fold (this is another good reason to set-up two otherwise identical printer options). Set the top two on this list to 'No' (all three if you use fan-fold).

The selection 'Accepts top-of-page commands' might be a worry, but set it to 'No' anyway. In most cases it is better to force the program to control repositioning of the page, even if the printer is capable of doing this itself.

Leave the Platen width setting (the roller of the printer) alone unless you've got the 132-column printer. If you have, reset this to 13.2 inches (at 10 characters to the inch).

Interface card

NOW FOR for the interface card – the first major source of compatibility problems. These cards usually have some filtering function and a certain amount of intelligence, but they differ enormously so you'll have to look-up the manual if you are non-standard and try to work out what needs to be put here as an interface card command. Some of them don't need anything, but let's assume that yours does.

What you are going to do is type in a sequence of single-key instructions which will be stored in the program and issued every time you print. They will appear at the head of any data being sent to the printer. These instructions are only to the interface card; they tell it what to let through, what to change, and so on, and after the card reads these instructions it knows whether they should or shouldn't be transmitted on to the printer.

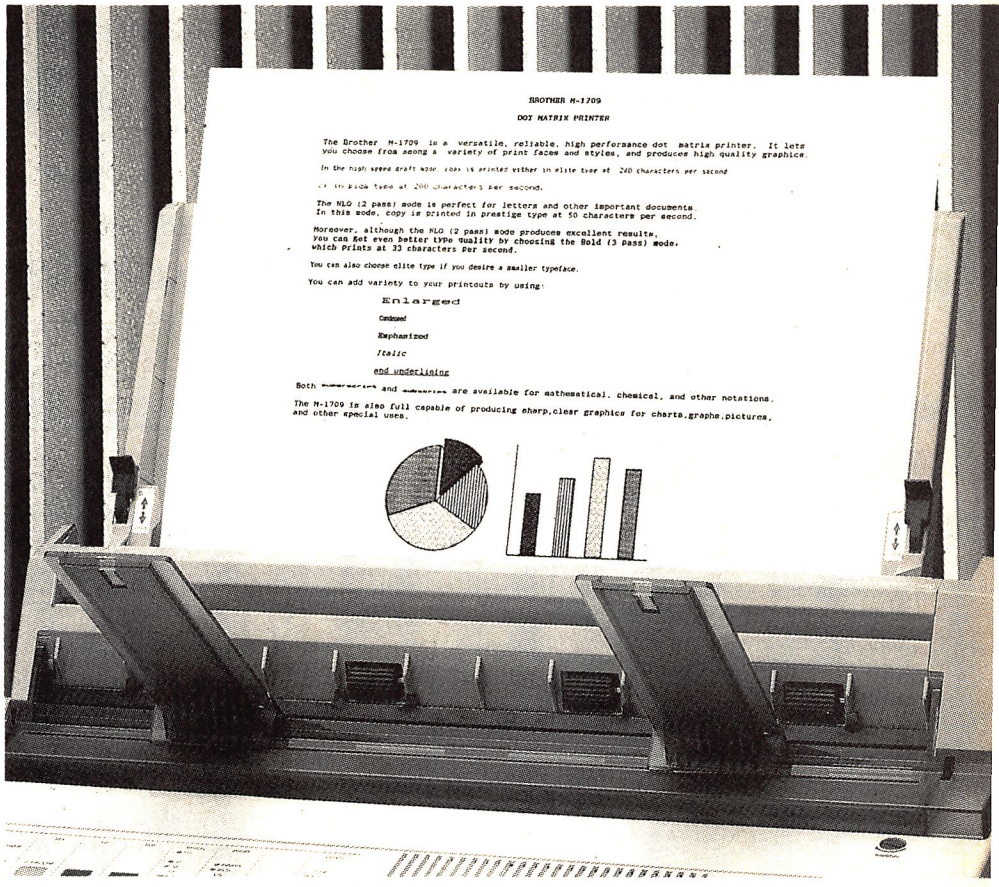
One of the jobs the interface card often does is to control how many characters pass through before a carriage return and line feed are issued. Normally the program is making this decision anyway, but the card acts as a last line of defence to ensure a certain limit isn't exceeded which could make the printer choke-up.

The Apple standard default command sequence for interface cards is therefore: Ctrl-I 80N. You would enter this by first selecting 'No' (the old one isn't correct), then holding down the Ctrl key while hitting I, then immediately typing 80N. Then get out of the chain by holding down the Shift key and hitting 6 (which is actually the 'control' sign).

You'll notice that the 80 here specifies the maximum number of characters the card should let through before a return, so if you are using a printer with the wide platen you'll have to set this to 132.

What happens if you've got the interface card set to 80 characters and you are printing with a condensed typeface (the Epson can print 17 to the inch)? Will it cut the print line half-way across the page? That depends on the interface card, so you've got to suck it and see. It only takes a second to make changes, and a second to swap back if you are wrong, so it's no big deal.

In case you don't have an interface card manual, and the Ctrl-I 80N doesn't work, try leaving the card with 'None', or try Esc x1, or Ctrl-I 0N (zero). As I say, there's a lot of variation.



Mastering your printer, interface card, AppleWorks and computer can take time and plenty of experimentation – but once it's done you should be able to print sub- and super-scripts, boldface and change the characters per inch, just like the professionals!

Printer codes

NOW WE HAVE set-up the interface card, we are at the stage of changing or adding printer codes. These are codes that go to the printer and command it to do things like 'Print the next text in expanded characters, or 'Print this using the German character set' or 'Print this using italics'.

Some of these are stand-alone commands that stay active until replaced by another, while others are always in book-end pairs which need both a start and a stop command. The trouble is that printers vary – sometimes they need both, sometimes only one, so you'll have to keep your manual alongside. And very often you'll find that the manual will call for, say, decimal 13, but AppleWorks insists that you type in the ASCII equivalent (which is Ctrl-M) so you'll also need to have your ASCII table handy.

The first choice under the Printer Codes selection is Characters per inch (usually abbreviated 'cpi'). Remember, this is the CI option that allows you to embed a command into your text using the Open-Apple-O command within the word processor. My Epson LX-80 has only three choices – 5, 10 and 17 characters to the inch – with 10 as the default size if nothing is specified; 5 is the expanded text, and 17 is the compressed.

I can put in all three commands to make these work. I choose 5 by typing it at the bottom of the menu screen, and then on the new page I type the instructions that tell the Epson when to use its Expanded typeface. But before I do this I realise the Epson doesn't have a simple way to turn the other typestyle off, so I precede this new instruction with the reset command. This is a case of a stand-alone command, but your printer might use book-ends.

The sequence I will use here is to type Esc, followed by Shift-2 (the @ sign), followed by Esc again, followed by small x, followed by Ctrl-A, followed by Esc again, followed by Shift-W (capital W) followed by Ctrl-A, and then get out of the chain with a Shift-6.

This might look horrific, but it makes sense if you've got the printer manual in front of you and you realise that you can chain a whole series of commands together to tell the printer to do whatever you want.

Step through this list with me: first the Esc @ sequence which is standard in Epson (and many other printers) for the reset command. This switches off anything that has been happening before. Then the Esc x, Ctrl-A– sequence, which tells my printer to use the Near Letter Quality (NLQ) mode. Then the Esc W, Ctrl-A sequence which tells it to use the expanded (5 cpi) type. All of this came from the manual – although I must say it is a tedious business working it all out the first time – there are so many possibilities.

Under the Lines per Inch selection you've only got the choice of 6 or 8, but things get interesting down at the Boldface, Subscript and Superscript level, and with the Underline selection. It's not readily apparent why Underline should be out here on its own, but you've got to remember that different printers handle underlining in different ways. When you come to enter command sequences for underlining, you'll first have to tell the program how your printer handles the process, either by doing everything at once, or running back over the typed area and adding the underline later.

This might look horrific, but it makes sense if you've got the printer manual in front of you and you realise that you can chain a whole series of commands together to tell the printer to do whatever you want.

Dot matrix printer

IF IT IS a dot matrix printer it probably only requires stop-start commands – which makes this the same as most of the other command sequences. In the word processor you will have to use the UB sequence embedded in front of the section to be underlined, and the UE sequence at the end. So when you select this (start-stop) choice in the set-up you'll be asked to give the actual commands from the manual that start and stop this function.

Usually this will be an Esc or a Ctrl command followed by a logical condition where 1 equals true, and means go ahead, while 0 equals false and stop. What makes it awfully confusing with the Epson is that it can use either decimal 1 and decimal 0 (in other words straight from the keyboard) or 1s and 0s. So you can write the code line as Esc-1 or Esc Ctrl-A to switch on (that's a hyphen in there after the Esc!) and Esc-0 or Esc Ctrl-@ to switch off again. (If you look at your ASCII tables you will find that Ctrl-@ equals binary 00000000, while Ctrl-A is binary 00000001). Don't ask me why both work!

To round out this underline section, you might need to use the selections 'Printer character, backspace, underline' or 'Print line, carriage return, print underline' if you've got an impact printer. You can see what these mean by reading them carefully: the first prints a character, then backspaces, and prints the underline before moving on; the second prints the whole line, then returns (but no line feed) to over-print the underline. This approach is necessary with impact printers, and it could be used with some dot-matrix as well.

Everything else (boldface, subscript and so on) you should be able to work out for yourself, you'll find the codes in the manual. Just string them together in a line and try them out – you won't always need the reset command. There's one 'fudge' which lets you add a lot more features to your options. This comes about because we only use a limited number of the characters-per-inch options (in the Epson, only 5, 10 and 17 cpi are available).

The default for the Epsom is to print at 10 characters to the inch, so if I specify 6 within my word processor (which is illegal) the printer will print 10 cpi, but, and here's the trick, it will still send to the printer any control command characters I have (illegally) attached to character size 6 in the set-up. With the Epson you need to start these sequences with Esc x1 (to select the NLQ print) then an Esc ! sequence (called Master style), then either a Space or a Ctrl-U. Try also Esc x0 (for draft print style) plus Esc ! followed by a decimal 9, or a T, or Ctrl-U.

You can add one of these sequences to each of the character sizes (not 10) and this will give you an enormous range of selections as long as your printer can handle the output. I've made my size 6 cpi selection the British character set, for instance, simply by adding Esc R Ctrl-C as if it was the 6 characters per inch command, and this way I can easily swap my output

to the printer to give me the pound sign. I just insert a CI = 6 command (through Open-Apple-O) into the document while I'm writing. This then sends the British character command, but drops back to the default 10 cpi setting. Try it. □

Mastering styles

AS MENTIONED above, the number (n) used in the Master Style sequence is a single decimal number that you can calculate by adding up the numbers corresponding to the features you want. It creates a single command that provides a whole range of features. For instance, you can choose either the Pica (10cpi) typestyle or the Elite (12cpi); decide whether to have it condensed, normal or enlarged; decide whether it should be Roman type or italics; and decide whether it should be single or double struck, all with one number.

For example on an Epson, Elite, Condensed, Single-strike, Italics gives us 1 + 4 + 0 + 64 = 69, and if you look up your ASCII chart you will find the key that corresponds to the 69th character in the table is the capital E. So, to set-up this sequence in Near Letter Quality mode we would enter Esc xl Esc ! E – that's all there is to it.

One problem with the Master Style select system is that it overrides other commands in the same process. If you have, say, part of the page printed in Elite roman, and you want the rest to be printed in Elite italics you may think you can do it by just issuing the Esc ! @ command (@ is the 64th in the ASCII list and you could issue this through one of the fudged characters per inch selections). But if you do, the command will turn-off the elite, and turn on Pica. It will see the @ command as 64 + 0 (which means Pica), so you will have to use the 65th character (capital A) to stay with elite. The point is that the Master Style command completely resets all typestyle characteristics; you can't just add italics on top of the typeface that you are already using.

If you want these commands to apply to large blocks of text (at a minimum, line by line) then you can set them by using spare character per inch settings. These commands can't be embedded between words, they always default to the beginning of each line. When you want to discontinue your changes, you've then got to issue another command to override the first, so it always pays you to keep the 10-character an inch selection with the Pica 10 setting – (Esc xl Esc ! Ctrl@).

If you need to write in other languages a lot, you might consider adding some of the international character sets to your list of characters per inch selections (remember, you can use any from 4 to 24), and of course there's nothing to stop you having half a dozen copies of the AppleWorks disk each with its own customised set if you really want to make life complicated. The various Epson international character sets actually only change the appearance of a dozen of the key strokes. In the standard US set these are the changes are to Shift 2, 3, 4 and 6 keys, the upper and lower bracket keys, the forward slash, the colon, and the upper and lower tilde keys. With the Japanese set selected, for instance, you get the Yen sign instead of the US forward slash, while in Norwegian or Danish this same key becomes a weird character similar to the Greek Phi.

For the more advanced Apple II users, you may like to have a go at making changes to some of the fixed printer settings; in effect to customise all three printer choices. I am in the middle of trying to work out how to do this.

To add these languages to your characters per inch selections, precede each with the Esc xl command for Near Letter Quality, then add Esc R for the International Character selection, followed by a control key for the country designation. These are all Ctrl key commands: Ctrl @ for the USA (gives problems with Appleworks version 2.0); Ctrl A for French; Ctrl B for German; Ctrl C for English (Ctrl D doesn't work, so forget it); Ctrl E for Swedish; Ctrl F for Italian; Ctrl G for Spanish; Ctrl H for Japanese; Ctrl I for Norwegian; and Ctrl J for Danish.

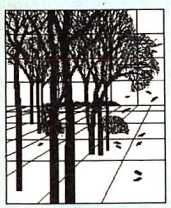
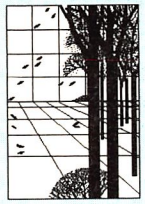
For the more advanced Apple II users, you may like to have a go at making changes to some of the fixed printer settings; in effect to customise all three printer choices. I am in the middle of trying to work out how to do this, so I can't give you an answer, but I can help you start. If you BLOAD the SEG.PR program on the AppleWorks disk to its standard memory location $2000 (using BLOAD SEG.PR, A$2000, TSYS) you can then enter Monitor and make the changes to the standard printer specifications.

You'll find the list of standard printer configurations all in order and they are generally separated by a wad of $00s. The standard Epson settings start at memory locations around $2440 and you can identify them by a series of command sequences beginning usually with $1B which is the Escape character. So you'll find a series something like –

$04 1B 40 1B 3D $03 1B 70
31 $07 1B 70 30 12 1B 50
0E $07 and so on.

Note that preceding the Escape character ($1B) is a measure of the number of characters in each command sequence, and if you check the Epson manual you can work out what each byte in the sequence is intended to do. The command sequences for the standard Epson FX printer on my disk starts at $28CE. If you just want to play around and see how it all works, the best approach is to create a new copy of the disk and remove any existing custom printer, then add features to a new custom printer progressively. As you do, bounce out to monitor and check out what is happening with the bytes in the appropriate part of memory. When I've got some time I hope to create a couple of totally new custom printer specifications, then copy the assembled code into two of the unused standard printer options. This will then leave me free to customise another printer, and give me three fully customised sets on the one disk. I know it can't be this easy! If you want to have a look at the SEG.PR file on the disk with Pro-byter or something similar, you'll find the custom printer section (the last on the list) at Block $114 and the printer selection directory structure down at Block $EB.

So far, all I've had time to do is to fill up the characters per inch and other settings with nonsense characters, then go back to the disk or into memory and try to work out how the program stores and uses them. This, I'm sure, is re-inventing the wheel – someone out there must have gone into this in detail, and if they let me know, I'll pass the information on through this column. □

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RITA PLUKSS



Space Racer and SkyChase

DATAFLOW IS THE exclusive Australian distributor for Broderbund programs and they kindly sent two of their offerings for the Atari ST for my perusal. Now, I must mention that games and I have a mutual understanding; I will leave them alone if they leave me alone, and they usually do. It's not that I have anything against games, but at my time of life the reflexes are not what they should be, and my eye-hand coordination is a bit sluggish.

However, knowing there are some dedicated game players around I could not in all sincerity refuse Dataflow's generous offer. So what to do? As I sat and tried to work through the problem, the game players that surround me were eagerly warming up their joysticks! A solution finally dawned upon me, and I asked rather humbly, if they would like to play a couple of new games. So as they played I sat, watched and listened, and the reviews were born.

Space Racer

THE FIRST game was Space Racer by Loriciels. The scenario is set in the 25th Century. Times have changed, war no longer exists, disease and hunger have been eradicated, and would you believe, life has become boring. Whether this is due to a more humane social environment or for some other reason has not been explained. Anyway, to recapture some of the danger and excitement that used to be part and parcel of life in the 'good old days' deadly space race tournaments are held every three years. Contestants are selected from the best racers from various planets to compete in the Space Racer Championship. You have been selected to be Earth's champion and the end play is victory or death.

On first impression Space Racer seemed like an updated version of Pole Position. The familiar cars have been replaced by futuristic wheel-less machines that are ridden in the manner of a conventional motorbike. Action takes place on one of three worlds (The Garden Planet, The Industrial Planet or The Planet of the Skulls). Essentially the game revolves around you and two other computer opponents racing around a twisting track. You can control your player with either a joystick or from the keyboard, but the joystick gives a better response.

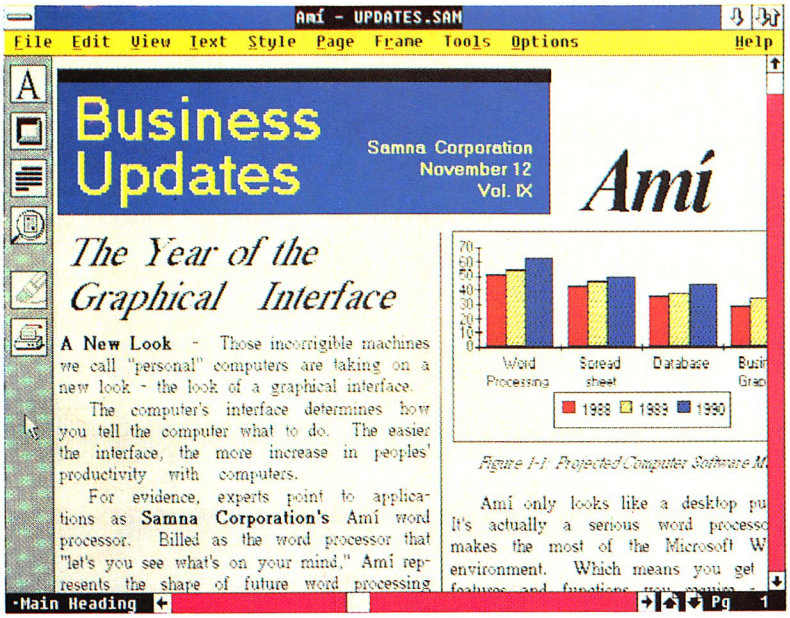
Changing altitude uses up energy, so finding an optimum level at which to fly is important. It's probably best to try and maintain an even altitude, but this becomes difficult when the track undulates and you have to fly around or over opponents. If your energy levels are high you can always simply shoot your opponents out of the way, but there is a tendency to lose speed whenever this maneuver is attempted. A more satisfactory way of ridding yourself of the opposition seemed to be to give them a nudge and send them out of control. Whenever your energy supplies start to run low they may be replenished, during the game itself, by flying through blue energy spheres.

After level three the track layouts repeat themselves, although there are additional hazards to avoid. Graphically the game is pleasing with background screens being sufficiently realistic to enhance the visual enjoyment of the game. The space racers are well drawn and their movement is smooth. I liked the way the riders banked into curves as well as the realism of the 360-degree rolls when the racers clipped



Space Racer is an updated version of Pole Position with the familiar cars replaced by futuristic wheel-less machines ridden in the manner of a conventional motorbike. Action takes place on one of three worlds (The Garden Planet, The Industrial Planet or The Planet of the Skulls) and the game revolves around you and two other computer opponents racing around a twisting track.

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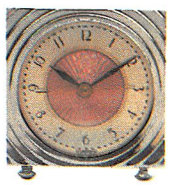
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SkyChase a flight simulator for the Atari ST. It offers a one-on-one dogfight scenario in which you fly a mission against either another human opponent (using two joysticks) or compete against the computer. There is also an option of two computer pilots battling it out in the skies.

one of the many hazards alongside the road.

After playing the game for a while the novelty wore off, which is quite understandable. I mean, how many times can you go around one of three circuits without a feeling of deja vu? The choice of function key F2 to pause the game seemed a bit odd as most games adopt the spacebar as a means of pausing the game – it is easier to find in a hurry or panic situation. In summary, Space Racer seemed interesting, graphically pleasing, relatively easy to control, but unexciting to play over an extended period.

Space Racer requires a 520ST or 1040ST with a colour monitor and is distributed on two single sided disks. My review copy came in a sealed box which when opened revealed a slight problem – the metal protector and return spring had come off Disk B and could not be replaced, so there was no protection against dust and the like. Always check your purchases before you leave the shop in case something like this happens to you. In fact it is probably a good idea to ask the salespeople to boot-up the disk just to check it out.

SkyChase

SKYCHASE BY Maxis (also distributed by Broderbund) is another flight simulator for the Atari ST. It requires a 520ST or 1040ST with a colour monitor. Essentially SkyChase is a one-on-one dogfight scenario in which you fly a mission against either another human opponent (using two joysticks) or compete against the computer. There is even an option of two computer pilots battling it out in the skies.

The available options in this game are simply staggering. There is the choice of six American and Soviet planes and even a lightning-fast paper aeroplane. There are vast choices in how much fuel should be carried, ammunition and missile payloads, missile lock thresholds, size of bullet hit areas, trigger timing, grid sizes, G-force blackout threshold, and four levels of computer skills. The last option effectively allows one to handicap the computer opponent.

The length of each game is limited to a finite time depending on the amount of fuel allocated and does not end simply with a kill. Points are awarded for an opponent firing a missile, destruction of opponent with machine guns or a missile, opponent crashing into the ground, ceiling or perimeter, and a mid-air collision. Despite my personal prejudices, I think SkyChase would appeal to those who like flight simulator games, and the greatest pleasure would come from two human opponents playing against each other, rather than a human versus computer (the version played for this review).

The pace of SkyChase can become quite furious – I am not sure how anyone can keep their eyes on the instrument panel. But if you can train yourself to accept, recognise and make valid decisions based on all that information while you concentrate on the skies, then while you are playing the game you are increasing your visual interpretation skills – no mean feat.

Hints, tips and ideas!

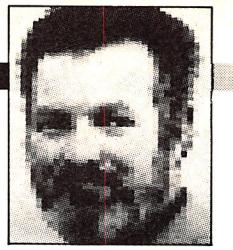
Got any hints, tips or ideas you'd like to share with other Atari users? Or maybe you've discovered (or written) a great new program you'd like to tell others about – if so, send them (on disk) to *Your Computer*, PO Box 227, Waterloo 2015 NSW and we'll pass them on to Rita Plukss got possible inclusion in the column. Please include a printout of the disk and caption any illustrations. Unfortunately, because of space limitations, we cannot publish listings over 200 lines long.

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Go Forth and C

I AM ONCE AGAIN amazed at the response for disks containing F-PC (or F88 as it is also known). It would appear that Forth is of interest to a large number of people in the computing fraternity, even if they don't actively use it. One of the interesting letters I received was from Jim Goulter in Casino. Jim offered many comments on what he saw as 'the ideal Forth system.' His wish list reads –

- ☐ 32-bit integers
- ☐ ROMmable (headerless) code
- ☐ Breaking the 64K barrier
- ☐ Standard File structure for source code
- ☐ A scaling word
- ☐ Floating point source code
- ☐ Decompilation of words
- ☐ Debugging
- ☐ Simple multi-tasking
- ☐ A good editor (Jim's comment – 'Down with line editors!')

All I can say in reply is that I hope he likes the copy of F-PC that I sent to him. Everything on his wish list was just answered. In addition, there are some features of F-PC (like string handling ability) that most people don't even think of asking for in Forth. Unfortunately, the version being released at this time is only a beta version, with several bugs in it, but nonetheless it is an extremely promising system.

One other point that some people seem to miss in their comments on Forth (Jim is certainly not alone here) is the ability of the Forth user (or programmer) to extend the language using the CREATE. . . .DOES> construct to create new variables and constants of longer length than normal. For example, a double precision constant (and therefore a DP variable can be defined using –

```
: DPCONSTANT
    CREATE      Create a dummy header
        , ,     Set aside TWO storage lo
                cations for the constant
    DOES>       Now define what DPCONSTANT
                does  at execution time
        DUP 2+  Copy the address of the
                DPCONSTANT and increment
        @       Fetch low order part of
                address
        SWAP    Put low order part on top
        @       Fetch high order half
;               Terminate definition
```

The ready-made interactive editor, the assembler, the virtual storage, the debug facilities and so on, make it very quick to get an application up. As a rule of thumb in my experience I can get something running in one-tenth on the time in Forth as I can in C.

Never underestimate the power of CREATE. . . .DOES> (or its alternative form <BUILDS. . . .DOES>). For those wishing to play around with extended precision numbers, don't forget that you'll also have to define words to add them, multiply, print and so on.

Mass storage

LAST MONTH I discussed the manner in which Forth is stored on disk and which screens are used for the system, error messages and user screens. Of course, most of that description doesn't apply to F-PC, because of its different mode of operation. For those with systems that still operate on the old 1K screen, a word of advice.

It is often tempting to write source code and then devote several screens to the explanation and documentation. The very nature of Forth screens makes this practice very dangerous, as subsequent editing may change their position or overwrite them. It is for this reason that the concept of 'shadow screens' was developed. Shadow screens are 'mirrors' of the appropriate source screen that contain no source code, but only information concerning the words contained on the source screen. There are several Forth words that take care of the storage and manipulation of these source and shadow screens and SHADOW very often has its own vocabulary, containing appropriate words for the manipulation of the shadow screens.

Forth and C

I HAVE OBTAINED a fascinating comparison of Forth and C, edited by Leo Brodie (the man who brought Forth to the masses), which will appear in its entirety in this and the next issue. Here he looks at development performance and operating system performance, and next month he looks at developing on the target hardware and readability. The comparison was brought to my attention by Ken Curry of Energy Control, Sumner Park Qld; we reprint it here with the permission of the copyright holder. Correspondence is welcomed on the following text –

Forth and C are both development languages commonly used for microprocessor-based control systems, instrumentation, and other real-time applications. A recent survey of software engineers showed that over 70 per cent were familiar with C, and 42 per cent were familiar with Forth. The purpose of this article is to compare Forth and C from the point of view of a number of programmers who have used both programming languages extensively.

C is quite popular; it has a relatively fast execution time and was sponsored by AT&T Bell Laboratories. It has also been criticised for being 'cryptic and unreadable.' But the programmers we interviewed focused on some completely different issues:

☐ Forth's interactive development environment can shorten development time by as much as a factor of ten with respect to C, even when C is in the fabled 'programmer heaven' of Unix.
☐ Versions of Forth that come integrated into a real-time operating system environment (such as Forth, Inc's polyForth) can provide application performance at least a fast as C, due to efficient OS conventions.
☐ Forth can be easily run in the actual development hardware, allowing it to be used for interactive testing of the development hardware itself.
☐ Forth's extensibility and simplified syntax makes programs extremely easy to read, maintain, and modify.

Development environment

THE MOST SERIOUS complaint made against C by the programmers we interviewed was the agonising slowness of the development process itself. As with most compiled languages, to make a change in C requires leaving the program, loading a text editor, opening a source file, making the changes, loading the compiler, compiling the source, loading a linker, linking the compiled routines with library routines, and finally loading the program, Debugging may require yet another program.

As a result, making even a simple change to a C program may take 20 minutes or even longer. Moreover, each of these programs (editor, compiler and so on) has its own rules and commands. As Leon Wagner, a consultant in Madison, Wisconsin, expressed it, 'It's like having to know four or five languages just to write and test one program.'

Wagner describes a typical C develop-

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ment environment: 'I was programming in C running under Unix on a VAX 11/730. We had eight users on the machine at any given time doing program development and testing. We kept most programs in manageable sized units that we compiled separately. This was important because compilation is so slow. The object output from all the modules could be linked together with the linking loader, which was also very slow. If you were editing a change in one module, recompiling, then linking and testing with the debugger, that whole cycle could easily become about an hour in a large sophisticated program.

'I found it ridiculous that the response time of the editor for an insert was about two seconds. It was laughable on such a powerful computer. The development environment was cumbersome and annoying. We had this powerful computer but we couldn't tell what it was doing. Last year, on the other hand, I was working on an even larger project using polyForth on a PDP 11/44. Again we had eight programmers on the system, but the response was always instantaneous, and I could compile my entire program and have it ready to run in just a couple of minutes. What makes this even more remarkable is that the computer was also supporting a network of hundreds of slave 8086s at the same time, and there was never any performance degradation at all.'

Forth creates a software development environment in which all programming tools are resident all the time – editor, compiler, and even (in most versions) an assembler. Forth source is kept in 1024-byte blocks on disk. A block may be individually edited and compiled directly into memory, in a full-speed executable form. Loading such a block takes only a fraction of a second. Once loaded, Forth routines may be executed interactively from the keyboard, without any separate test programs or debugging utilities. Memory locations, data on disk, and even hardware interfaces can be examined directly, again without any special programming required.

A stand-alone version of Forth is particularly valuable in real-time applications. Neither Unix nor MS-DOS (the operating systems most commonly used to support C development) are appropriate as a run-time environment.

Programming interactively has an effect that goes beyond the actual minutes saves. Michael Ham, a freelance programmer and writer in Santa Cruz, California, describes it this way: 'The immediacy of the compilations enables the programmer to interact with the program as it's written. When the feedback form one's actions in immediate, one can achieve a state of mind in which one's efforts and effects each shape the other, so that one becomes lost in the work – a maximally productive state of mind. This experience is unfamiliar to most programmers simply because most programming languages are structured and implemented in a way that erects a wall of time and procedures between idea and result.'

Forth's interactive approach makes it ideal for developing programs through a process of successive prototyping. Cary Campbell, a programmer with IBM in San Jose, California, observes, 'Having experienced prototyping in Forth, C Pascal, Modula 2, Edison, Basic and others, I will claim that Forth is the hands-down winner for developing prototypes – having to do not with the language, but with the environment. In Forth that turns out to include a very rich set of things. The ready-made interactive editor, the assembler, the virtual storage, the debug facilities and so on, make it very quick to get an application up. As a rule of thumb, in my experience I can get something running in one-tenth of the time in Forth as I can in C.'

Operating system performance

ONE OF THE most unusual features of Forth is that it was originally designed to be completely integrated with its own real-time, multi-tasking, multi-user operating system. Although there are versions of Forth on the market that run entirely under a conventional OS, there are several professional versions (including polyForth) that do feature stand-alone operating systems.

A stand-alone version of Forth is particularly valuable in real-time applications. Neither Unix nor MS-DOS (the operating systems most commonly used to support C development) are appropriate as a run-time environment. This leaves the developer with two choices: either write a custom real-time executive, at some cost in time and effort, or buy a commercial run-time executive such as VRTX. Both approaches mean that the software development will take place in a different operating environment form that in which it will run, creating yet another 'wall' that the programmer must penetrate to test their work.

Since Forth was designed for the real-time world, however, it can support the running application as efficiently as the development environment. In Wagner's polyForth application, for example, he and his associates were developing their application on the same computer on which completed portions of the application were already running . This not only improves the development cycle, in many cases it also can represent a considerable financial saving by eliminating the need to purchase separate development hardware.

How good is Forth as a real-time OS? Obviously, different implementations will have different performance figures, but they can be excellent. Cameron Lowe of Bell Canada, for example, uses polyForth in an extensive on-line database application that supports over 60 users concurrently on a single 68000 CPU, with response times under one second. Forth,

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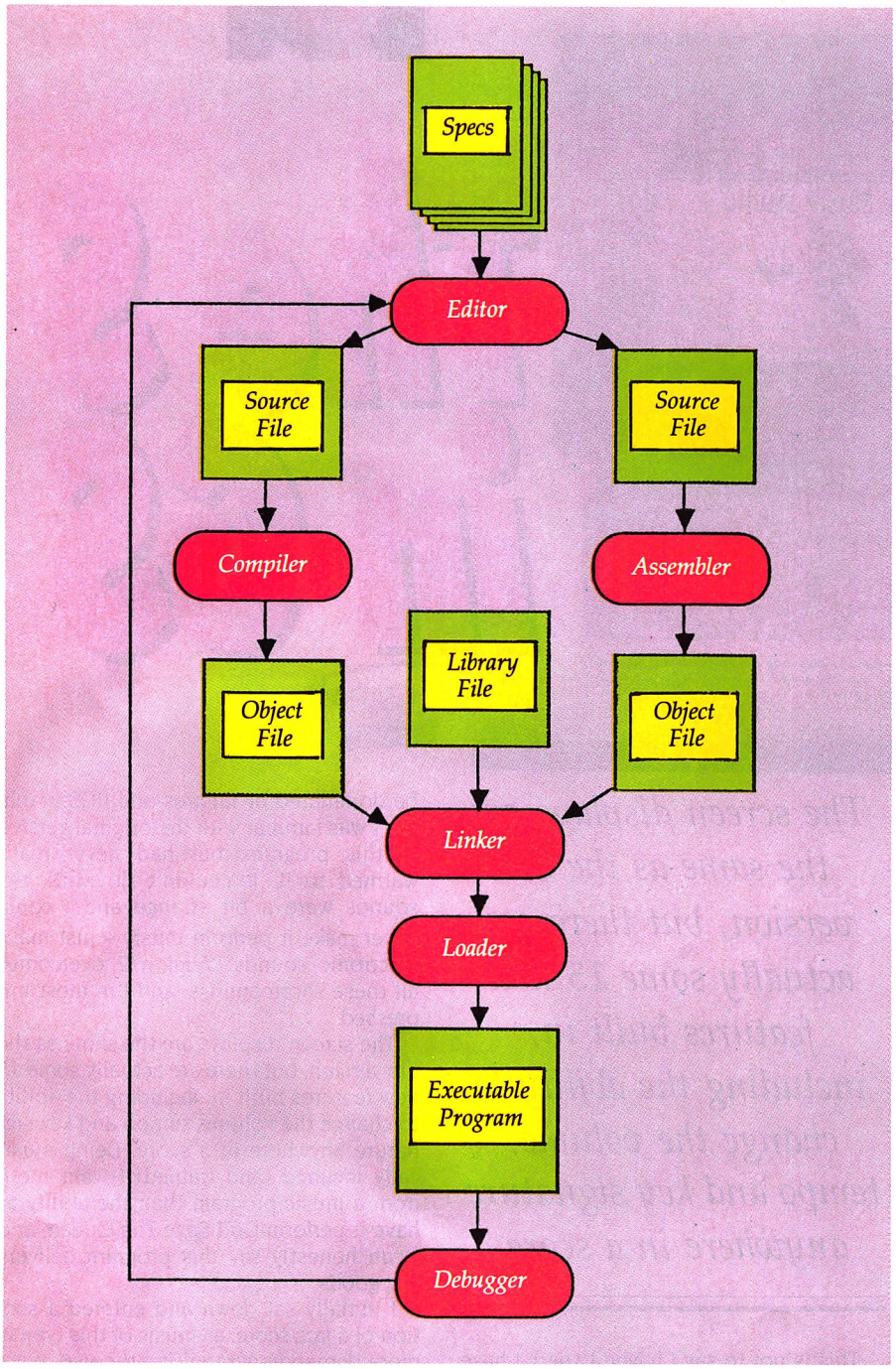
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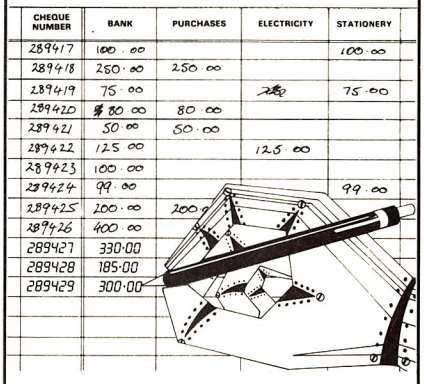
Typical software development environment for the C programming language.

Inc. routinely reaches programming courses with up to sixteen programmers on a single IBM-XT or AT running polyForth, also with instantaneous response times.

According to Forth, Inc, polyForth supports multi-tasking and multi-user operation even on 8-bit microprocessors. A context-switch in polyForth takes under 80 milliseconds on an IBM-PC or XT, and under 20 milliseconds on a 68000. PolyForth also responds to interrupts with no OS overhead, vectoring interrupts directly to the code to service the interrupting device. This is a very fast run-time environment indeed. □

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PETER PHILLIPS



The S in GS



THE BIG FEATURE of the IIGS is its graphics, and all GS software exploits this in one way or another. But how about the 'S' part of GS? The potential for making sounds is a rather unsung (sorry) part of this machine, and I'm glad to be able to describe a music software package this month. It was the sound feature that made me buy a IIGS in the first place, hence my interest in a music program.

As well, a rather sophisticated educational package from Broderbund has landed on my desk. Although educational software for the older Apples was very common, this one is the first I've seen specifically for the IIGS. And finally, some hardware. Owners of an Epson LQ printer can now make it emulate an ImageWriter LQ printer (no less!) using a new interface from Automatic Ice.

Music Studio v2

MY INVOLVEMENT with Apple II computers became quite intense during the years I spent writing software to allow a II+ to play a piano. This system, which included a certain amount of hardware as well, has provided me with a great deal of entertainment ever since I perfected it. I then had big hopes for the IIGS to allow me to extend my system, but its complexities coupled with limited time have prevented this.

The screen displays are the same as the old version, but there are actually some 15 new features built in, including the ability to change the volume, tempo and key signature anywhere in a score.

This is not to say I haven't tried. I have spent many hours trying to figure out machine language programming using the Apple Programmers Workshop assembler, in particular around the Ensoniq synthesiser IC integral with the IIGS. My hope was to make this rather sophisticated chip do all sorts of great things, including emulating a Steinway concert grand. Oh well...

Music Studio 2 therefore comes as a breath of fresh air in a world that seems to be dominated by failures and IIGS graphics. I was familiar with the original version of this program, but had never really warmed to it. It couldn't do MIDI, the sounds were a bit strange and I could never make it perform music – just make electronic sounds. Version 2 overcomes all these shortcomings, and I'm most impressed.

The screen displays are the same as the old version, but there are actually some 15 new features built in, including the ability to change the volume, tempo and key signature anywhere in a score. Being musically inclined (and trained) I want more from a music program than the ability to have it perform God Save The Queen, and I can honestly say this program delivers the goods.

I initially sat down and entered a section of a jazz score, as music of this type is more demanding, requiring the use of accidentals, dotted rests, triplets and so forth. I found, as a result, a few deficiencies in the software, although I'm probably being a little picky. For example, it is not possible to change the time signature within a score, and grace notes need to be developed using a demi-semiquaver next to the note being 'graced'. Dotted rests are not included, although you can make up the required time from the menu of rests available.

The sounds available are now very extensive, including various digitised sounds that are quite realistic. Using these, it is also possible to produce your own by modifying a given waveform from a rather strange graphical presentation that never seems to do what you want. I resorted to sheer experimenting, and found I could produce some most interesting sounds. (By the way, the best sound is produced by plugging your stereo system into the stereo earphone socket on the rear of the computer.)

MIDI is also supported, and if the required drivers are present, I assume a number of MIDI interface cards can be used. Real time record and replay are available, and the manual claims that notes can be entered onto the staff directly from a MIDI keyboard if you have a Macintosh-type MIDI interface. Unfortunately, at the time of writing I could not test this, as my MIDI keyboard is out of action.

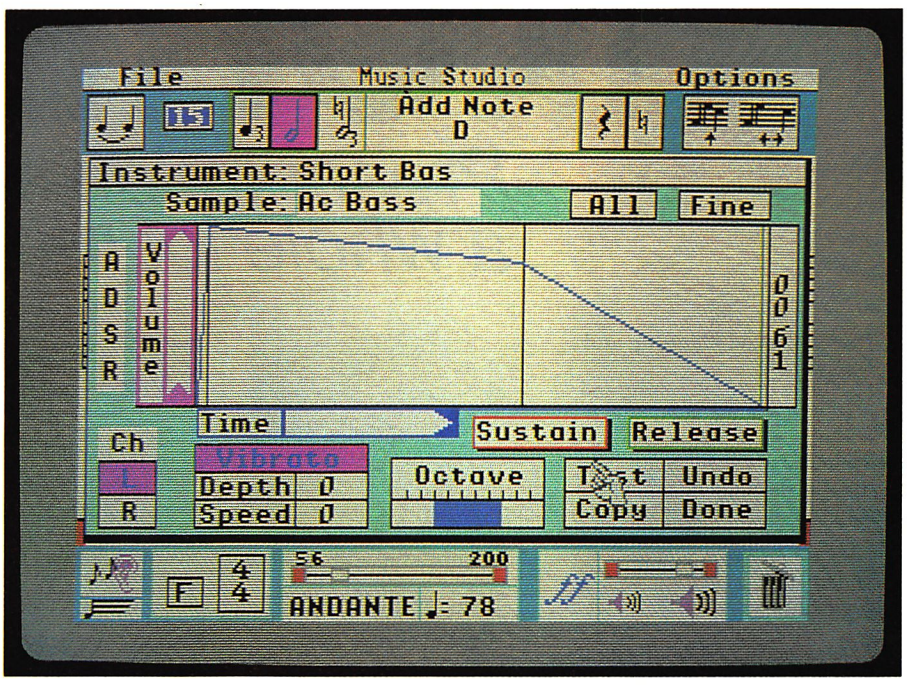
Another feature is multi-tracking. Music Studio 2 provides four tracks which can be enabled as required to allow any one of 16 voices per track to be heard singly or with other voices. A handy facility is 'block functions', which is quite easy to handle once you get the hang of it. This allows sections of a score to be moved, copied, inserted and otherwise manipulated.

There are many other features that can be selected, such as bar numbering, automatic insertion of bar lines, a new instrument for a section of the score and so on. There is also a beginners feature, which allows composition using a 'paint box'. Different colours represent different instruments, and the duration of the note is determined by the width of the 'blob' you put on the stave.

This program will appeal to a wide range of users, including MIDI fanatics. As a learning aid, you can hear how a section of music should sound by entering it (from the score you are studying) and playing it back at any speed. As a composing tool, music can be entered and modified until everything is correct. Then you can print out the score, with words if required.

You can use the computer to be an instrument in a group by first entering the music manually, then selecting the desired sound (violin, flute, whatever). Hit the play icon, and you're away with any sound you want, from drums to a full orchestra.

In general, the whole thing is easy to use, and writing music, though a bit tedious, is as easy as it can be with a computer. Because it is not copy protected, the program can be run from a hard disk. One minor complaint about the manual – Activision, the publishers of the program, generally produce a good manual, but this one is rather brief and leaves quite a few things unexplained. But that aside, those into music will find the program excellent. At last the S in GS is getting a look in.



Designing an instrument is a matter of taking an existing sound and modifying it by changing the shape of its graphical representation. Attack, decay and sustain characteristics can all be altered to give a wide range of sounds.

The screen displays are the same as the old version, but there are actually some 15 new features built in.

Online line learning

GEOMETRY, AN educational package from Broderbund, is aimed at students from year 7 and up who need help with geometry. The program will operate in tutorial or teaching mode, and the student/-computer interface promotes learning of an otherwise rather tedious topic. The software comes on three disks: disk one contains the system (version 3.2), while disks two and three share five chapters each of the ten chapters contained within the whole module.

The program can be set to follow the 'classical' approach or the 'simplified' approach, and allows the user to set the program so that it presents the material in the same order as the textbook being studied. Being an American program, it is possible that some of the statements and material will be in unfamiliar terms, but, paraphrasing Caltex's Sol: 'geometries is geometries.'

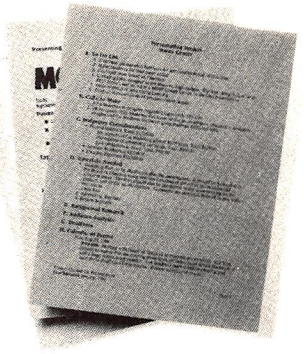
A chapter is selected from the Subjects menu, and after loading, an opening graphic invites you to start working through the chapter. Like a text book, the material is presented in pages, although unlike a book, some pages incorporate live graphics. For example, the first two or three pages may introduce a concept, and demonstrate it graphically. Then, following pages will give exercises covering the concepts already presented.

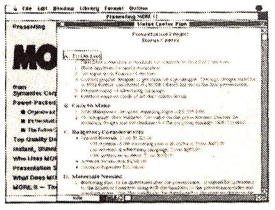
The material covers parallelograms, circles, polygons, triangles, area, volume and co-ordinate geometry. I could not find any trigonometry, although the right-angle triangle (called a right triangle) is given a pretty good workout without it.

Despite being a Broderbund release, the graphics are very simple, and I felt the

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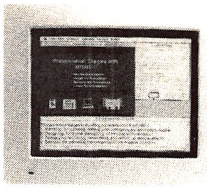




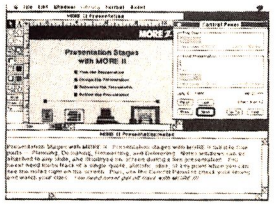
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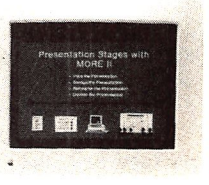
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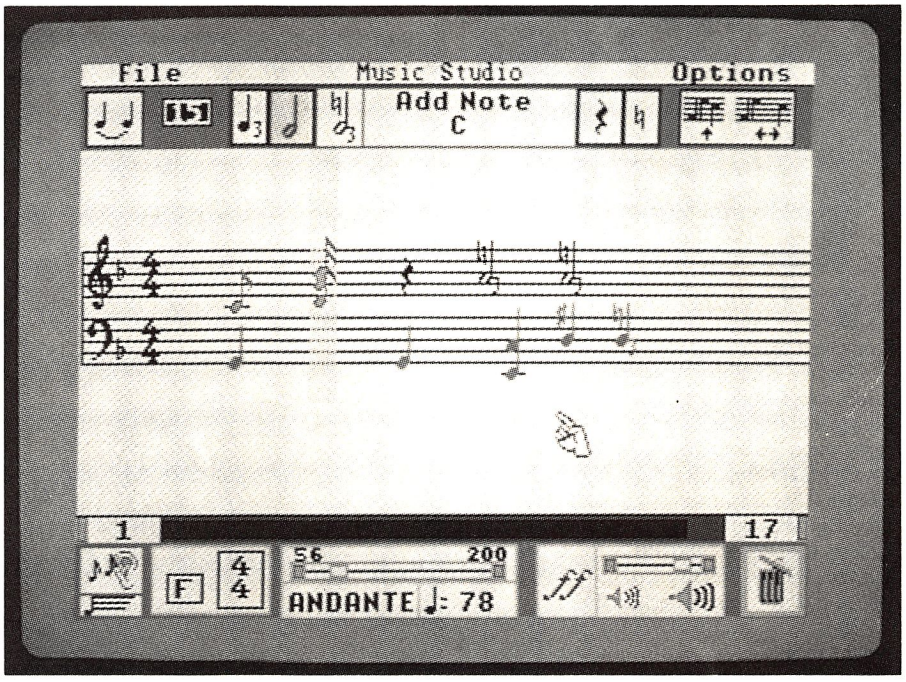
TULDIN

program to be a bit on the turgid side. A keen student would probably get a lot from it, as the information is very extensive and a considerable number of exercises are presented. But for those lacking dedication, the program is not really exciting enough to promote much more interest than a text book.

Of course, making exciting graphics for each geometrical postulate would not only require lots of memory, it would slow things down considerably – and this program is not exactly fast in the first place, even with a hard disk. However, if you have 1.25Mb of memory, it is possible to use the RAM disk, which speeds things up more than just a little bit.

Being a supporter of computers in education, I believe this program could find considerable use in a school situation. For example, if the school has a room full of IIGS computers, students could be set to work on those topics needing revision, and the self-paced learning approach of this package would allow each student to proceed accordingly. Even at home, a student swatting for an exam might be more inclined to hang up the skateboard and sit down for a bit of learning with the computer rather than reading the text book.

The program is copy protected, but can be loaded onto a hard disk. It will then ask for the original disk during loading, after which it will run from the hard disk. In summary, the program is very functional, rather unexciting, and makes poor use of the colours available with the IIGS. It contains an amazing amount of information however, and if you want to brush up on your geometry, then this one is for you.



Music is entered into Music Studio by selecting the required note value from a menu and placing it on the staff with the mouse. Different colours give different instruments, and automatic bar insertion can be activated if required.

LQ interface

LAST MONTH I described an interface, called the Ice Cable, developed by the Automatic Ice Company that would allow an Epson (or compatible) printer with a Centronics input to emulate an ImageWriter. This innovative company has now gone one better, and a 24-pin version has since been released.

The previous 9-pin version was intended for use with a 9-pin Epson printer, and was designed to allow emulation of an ImageWriter (I or II) when driven by a

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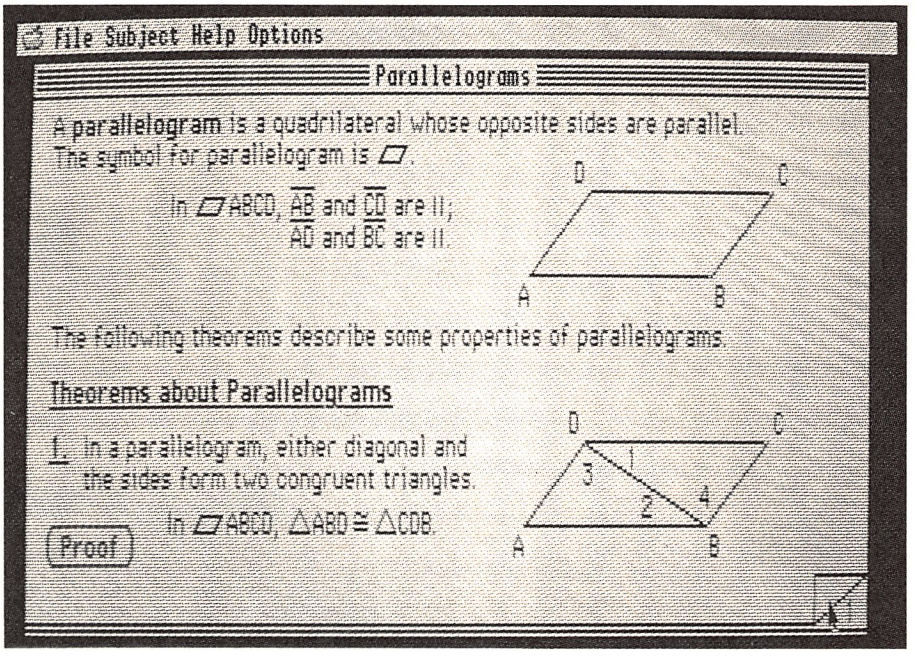
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Geometry by Broderbund is an educational package specifically for the IIGS. It is very comprehensive and is aimed at those from year 7 and up.

Mac or a IIGS via the serial printer port. In fact, if you coupled it to a 24-pin printer, such as the LQ-800 or the more recent LQ-500, the resulting printout would be 1.2 times higher than it should be, due to the printer characteristics.

Now that 24-pin printers are becoming cheaper, they are starting to gain popularity, and this new version of the Ice Cable is typical of the growing support for these types of printers. The new device looks the same as the previous version, but has two major differences: it can operate at 19,200 baud and emulates the ImageWriter LQ printer.

The version I have allows five configurations of the device by cutting various combinations of three tracks, labeled X, Y and Z. Future versions will be fitted with DIP switches. For example, with no tracks cut, the device will operate most Epson 9-pin printers in ImageWriter mode at 9600 baud. Older Epson printers require tracks Y and Z to be cut for this mode of operation.

If you have a 24-pin Epson printer, you can use the device to emulate the ImageWriter LQ by cutting track X for 9600 baud, or tracks X and Y if you want 19,200 baud. Cutting track Z only converts the device to a straight through serial to parallel converter. Having a 24-pin printer (LQ-800), I was most anxious to see the results, so I wrote a test document using all 11 fonts in various point sizes. For a comparison, I obtained a printout with the 9-pin version in ImageWriter mode, then repeated the exercise with the 24-pin version in LQ mode. As expected, the first printout was 1.2 times higher than it should be, but quite reasonable in quality.

The 24-pin version, set to emulate the ImageWriter LQ was, however, markedly better. Small point sizes were much cleaner and the overall effect was not far removed from a laser printer. Also, it was much quicker due to the transfer rate. I also tested the quality of a printed graphics image, but the differences were not enough to rave about.

You may remember I reported last month that a delay of up to 60 seconds occurred between selecting the print function and seeing the printer start working. It seems the unit I had was faulty, as neither the replacement 9-pin version or the new 24-pin version cause this. The whole thing works very smoothly, and does a great job.

One minor problem is that many Epson printers do not support reverse line feed, unlike the ImageWriter printers, and software (like AppleWorks) that uses this function may produce rather weird copy. Your alternative is an ImageWriter LQ printer if this is a problem. □

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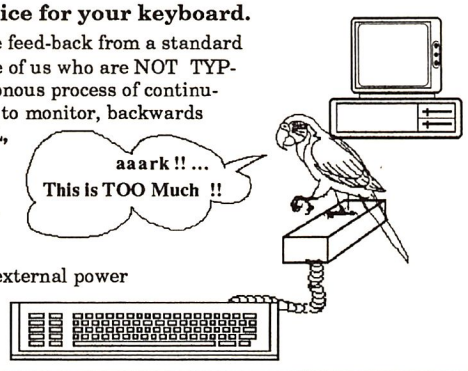
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JOHN BAILEY



Long distance learning

THE PAPERLESS office and the talking computer have been just around the corner since the day the first word was processed. You can bet that somewhere on, in, or around the box in which these marvels arrive there will be something on paper. It may be only a leaflet with a picture showing the on/off switch but it will be printed information and the user will have to 'read' it.

Users of all kinds of equipment have to be taught or shown its correct use. Modern farming machinery often has more complex operating instructions than most computers, yet farm workers still seem to be able to master their machinery very quickly. It is true that the old adage 'if all else fails, read the manual' lives on in the form 'real men don't read manuals'. But – by and large, country people would rather spend an hour or two on 'The Book' than risk damaging a harvester worth $120,000. This ability to cope with the expanding complexity of rural machinery is not a special thing, but simply that the new is mostly old technology tarted-up a bit. For instance, the modern internal combustion engine, despite the plumbing surrounding it, still works on the 'suck-squeeze-blow-go' principle.

The computer industry is not old technology to us country folk, but the hype that surrounds it is as old as the pre-owned chariot business. To take up the point made in my April column; the software and hardware developers have produced equipment that has outstripped the documentation let alone the readers of the manuals. Fear not, a veritable plethora of help is at hand.

The technical publishers of the world saw the opportunity for expansion into computer publications, and a number of them are now specialising in the field. Two notable examples that spring to mind are Que, and Sybex; both producing extensive libraries covering spreadsheets, database applications, operating systems and programming. In business applications Osborne-McGraw Hill produce a number of accounting and related titles and there are occasional gems to be found amongst the smaller publishers.

Why should we need to buy extra instruction when we have already bought the software or machine with manuals from the people that created it, and they should know more about it than anyone?

Technical And Further Education computing studies courses are very popular and provide instruction in most aspects of computing from novice stages in many of the same fields as the publishing houses. The only trouble with these courses for more isolated folk is the traveling by night through kangaroo-populated countryside and the heavy yawning the next day. TAFE also provides some correspondence and mobile short courses which can be accomplished at the student's own pace, but may require them to own a computer of an appropriate type.

Why should we need to buy extra instruction when we have already bought the software or machine with manuals from the people that created it, and they should know more about it than anyone? The first answer to this is that some of the original manuals are alright. But some are only useful if the operator could make the thing work without the manual. If you are like me and need things explained clearly then you too will need to read something that has been written, in English, by a person living in the real world.

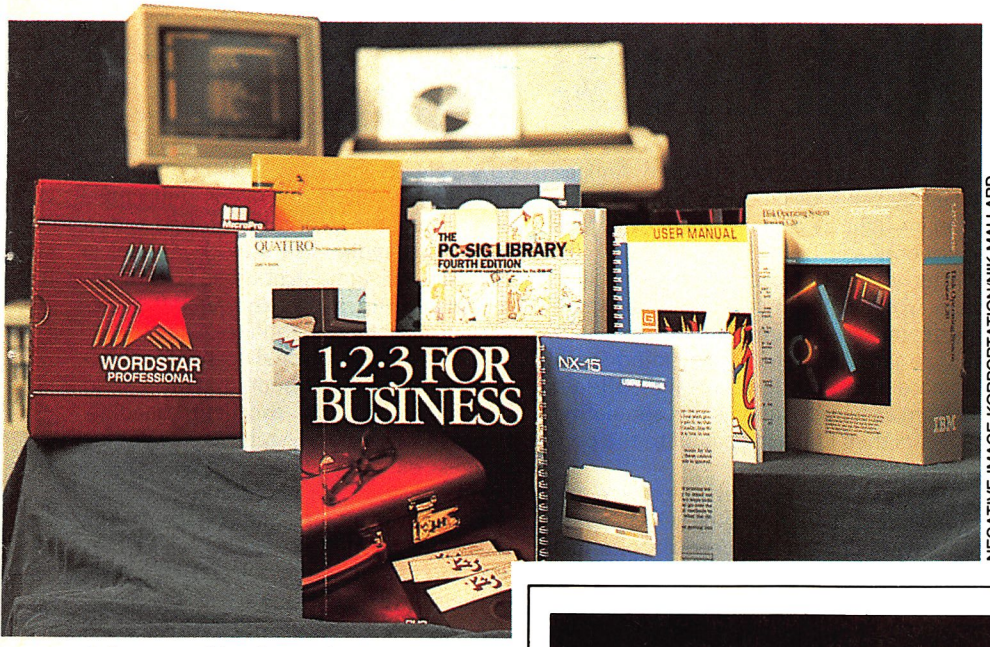
Another reason for buying computer books is that the original manual writer doesn't always explain the full capability of the software. A classic example of this is the Multidimensional Database facility available in VP-Planner. The VP manual includes a somewhat facile example about a Widget-making company and only hints at the enormous power of this tool. (It also glosses over the odd trap!)

If one could find a book devoted to this aspect of VP-Planner and Planner Plus it would have examples of a payroll system for casual workers giving monthly statements for individuals, a breakdown of the tax and super allocations for each individual, and the gross amount and so forth with the added ability of being able to page the spreadsheets month by month. It might include a paddock grazing record system or cropping planner, in short the system allows us to access a series of spreadsheets in three dimensions but we need more help than the manual can supply. The software registration promised a newsletter or somesuch, as did the last product I bought with Mr Osborne's name on it.

Judging by the number of texts surrounding dBase and Lotus those manuals don't have the secret to unforgettable communication. Indeed, most programming languages attract their share of 'how to' books, which is not surprising because of the open-ended nature of program writing. I have to admit that if the original manuals included something for everyone they would be a bit heavy.

Another source of knowledge for the rural learner is the various tutorial and example disks from some of the above publishers and also from the PC-SIG library. If a book lists many programs, procedures or spreadsheets there is often the option of purchasing these on disk. In the PC-SIG library there are many disks of spreadsheets, dBase listings and tutors. There are a number of tutoring disks included in the shareware libraries that deal with learning programming languages, operating systems and typing. The programming disks from Coronado Enterprises are well written courses of study and at least one has been adopted by a local TAFE tutor as the basis of a Turbo Pascal course.

Of course there is always a catch. The vast majority of useful computer books cost from $40 up and if one were interested in learning all about dBase it would



NEGATIVE IMAGE KORPORTATION/NIK MALLARD

Software and hardware developers have produced equipment that has outstripped the documentation let alone the readers of the manuals. Fear not, a veritable plethora of help is at hand.

be very easy to spend several hundred dollars on books and magazines devoted to the topic. There is no room here to review a barrel of dBase books for you but dLetter is good value. Try browsing in your local library; find something that mentions your area of interest and go from there. When you find a book that does good things for you it is worth-while buying it as a reference. The shareware collections may be similarly fallible, there are some really good programs in these libraries and some really useless ones. Literature is like software in that little of it is deathless and the bad should be put down as soon as possible. If a text or a manual is difficult to understand look in the bibliography and see if there aren't more legible tomes on the subject.

It is true that the old adage 'if all else fails, read the manual' lives on in the form 'real men don't read manuals'.

I hesitate to mention the Bulletin Board Services as a source of instruction material for country folk. As distance and the number of exchanges between you and the information increases, the legibility of the material decreases. This is a pity because it can be a quick way to gain access to good instructional material. My modem is on the market with it's software and I am searching for something that doesn't always produce alphabet soup.

I guess the final word is; read everything you can understand. Magazines like this one are usually very good value for money, so choose a good one and subscribe. A subscription ensures that you don't miss out on serialised articles like the Instruction Sets in this magazine. □

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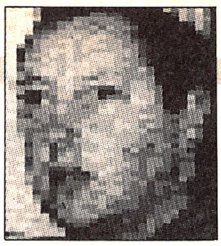
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GREGG FAULKNER



High flyers!

LAST MONTH I was less than kind to beloved Commodore when I reported the lack of support extended to Panther Games (authors of Fire Brigade). Shortly after I submitted the piece for publication, Dave O'Connor from Panther Games phoned to ask me to tone down my comments. It seems Commodore have had a change of heart and are now providing the much needed support to the guys at Panther Games. Nice to see local initiative getting some assistance, and yet another indication of the revised attitude at Commodore.

I have received several interesting packages in recent weeks. F-16 Falcon has just about prevented me from trying any of the others. Regular readers will remember my enthusiastic review of Interceptor F-18 a few months ago. Well, here we go again.

This flight simulator is extremely good. F-16 Falcon offers a choice of five skill levels, a dozen different missions, a huge variety of armament options, and variable numbers of MiG opponents. It also enables two players, on separate Amigas linked by cable or modems, to fight each other or fight as a team against the MiG opponents.

After giving the package a really thorough workout I can find only one small shortcoming. At higher levels it is very hard to land the beast, to my mind much too hard. I haven't flown a real F-16, but if they are as hard to land as this simulation suggests then I take my hat off to the people who drive them.

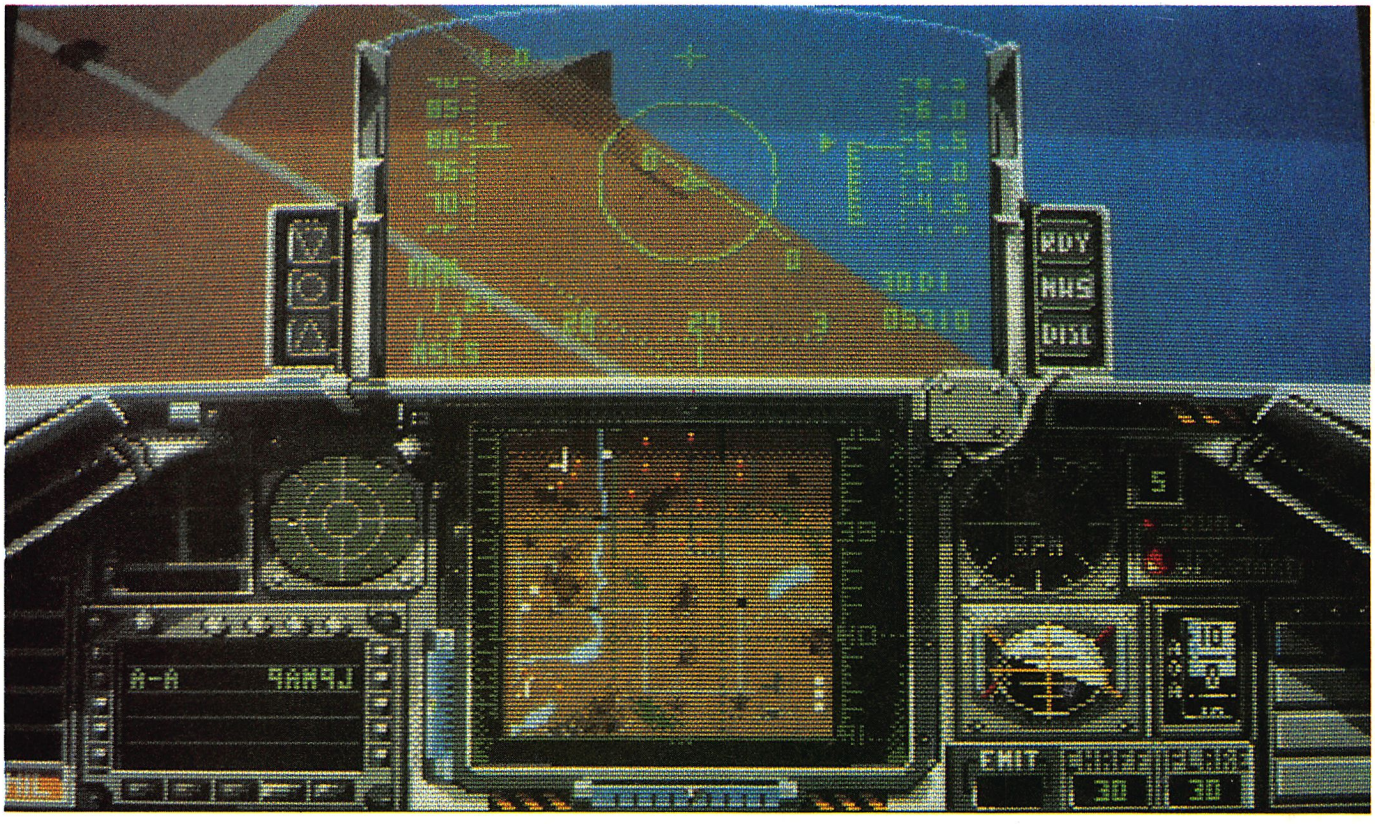
The two lower skill levels provide the pilot with a 'super' engine which magically maintains the airspeed despite manoeuvring and load. At higher levels you pretty quickly find out what 'pushing the envelope' is all about. Violent manoeuvres cause the F-16 to wash off energy very quickly and after-burner thrust can become necessary to stay in the air.

A load consisting of four Sidewinder air-to-air missiles, six AG65 air-to-ground missiles, a couple of Mk84 2000lb bombs and an external fuel drop tank pushes all-up weight to well over 30,000 pounds. At this weight the F-16 needs full after-burner thrust to get off the ground and in the air it handles like a truck. As fuel is burned and armaments used, the decreased weight allows the aircraft to regain its athletic performance.

The three-dimensional scenery and opponents are well presented, with a solid feel enhanced by excellent shading. Dozens of ground targets, including bridges, buildings, SAM sites and power pylons respond to accurate attack by realistically exploding and collapsing. The SAM sites warrant some respect as they are more than capable of inflicting a sting of their own on the unwary aviator.

A large 'world' is provided with scenery including mountains, roads, rivers and lakes. The 'enemy' airfield is at the diagonally opposite extremity of the world and is defended by SAMs and fighter aircraft.

As the F-16 pilot you have the ability to look out of the cockpit forward, backward and to both sides. When playing with



The three-dimensional scenery and opponents in F-16 have a solid feel enhanced by excellent shading. Dozens of ground targets, including bridges, buildings, SAM sites and power pylons respond to accurate attack by realistically exploding and collapsing.

linked Amigas (or an Amiga linked to a Mac or even an Atari ST) you can clearly see your opponent's aircraft in the appropriate view. The sensation of realism is very good, even allowing formation flying and team tactics.

Falcon is published by Spectrum Holo-Byte and retails for a very reasonable $70 or so. Highly recommended for all budding 'Mavericks'.

Word processor

NEXT UP IS yet another word processor. I'm fast getting to the stage where I can't remember what controls what when it comes to word processing, but I always seem to come back to good old WordPerfect. Roll on version 5 wherever you are.

ProText has been available for a while for IBM and compatibles, with the Amstrads getting a special mention. It has recently been ported across to the Amiga – very recently, as evidenced by the copy I received for review. The manual was Version 4 of the IBM-compatible manual with half a dozen double-sided A4 sheets of provisional documentation provided for the Amiga.

A sentence on the title page of the manual assures readers that 'This manual was written using ProText and printed from camera-ready copy produced by ProText on a Kyocera F1010 laser printer'. I find such a statement reassuring as the quality of the manual can then be taken as an indication of the capability of the package.

Just for the hell of it I'm going to save this text now as an ASCII file and import it into ProText and use that package for the rest of this article. Some hours pass...

I'm back, and guess what? I'm using good old WordPerfect again. I have had a few hours of trouble trying to get ProText to do what I want it to do. I can import my ASCII file alright, but ProText refuses to use the configuration I set for it. Instead it seems to want to set a line length of over 300 characters (which makes printing awkward).

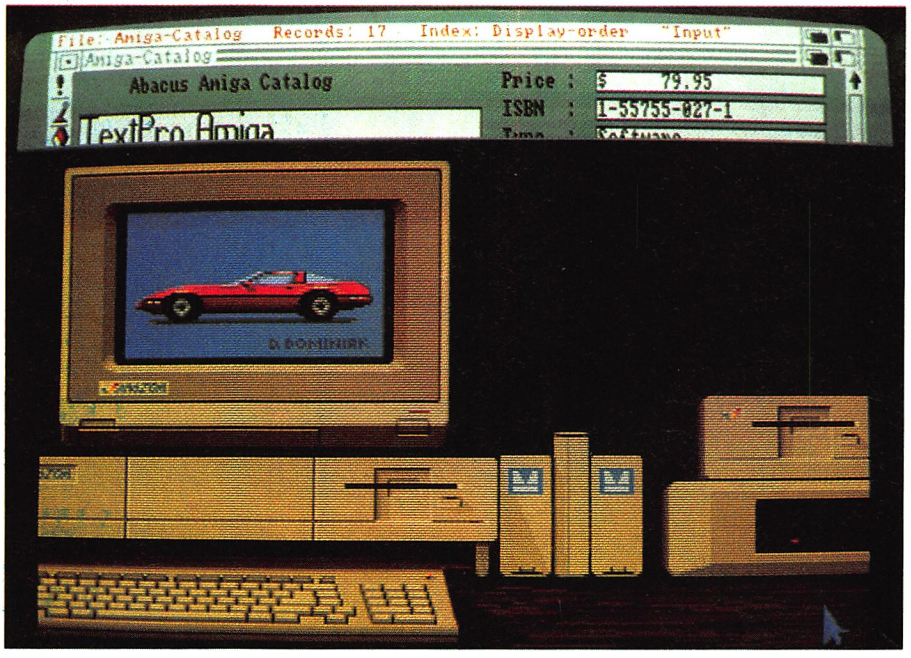
For now I'll assume the fault lies with me and won't criticise ProText. Rather I'll put in some more learning time and wait until next month to continue my evaluation of the package.

Relational database

NEXT CAB OFF the rank is a relational database management system called Professional DataRetrieve. Interestingly this package is published by DataBecker, Dusseldorf, West Germany, and distributed here by Pactronics, (02) 407 0261, of Chatswood NSW. It's good to see a lot of new software starting to arrive from Europe.

PDR (I'll use the abbreviation for convenience) is packed in a whopper of a carton which looks a million dollars worth. Inside the carton is a beautifully finished, comprehensive manual in a heavily-bound three-ring binder. Top marks for presentation. Packed behind the binder is an inner carton containing support documentation, promotional leaflets for other Abacus products, and a Software License Agreement envelope holding two disks.

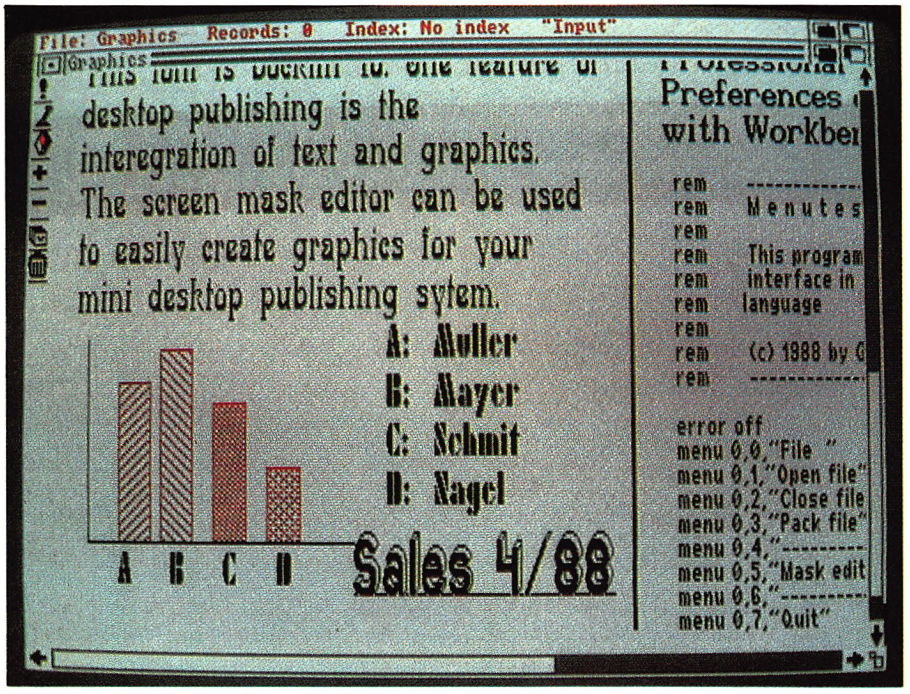
PDR uses a software protection system which I strongly support and endorse. The disks are initially heavily copy protected.



DataRetrieve caters for six types of data fields: Text, Date, Time, Number, IFF, and Choice.



F-16 Falcon offers a choice of five skill levels, a dozen different missions, a huge variety of armament options, and variable numbers of MiG opponents.



A comprehensive and powerful, Basic-like database programming language provides an alternative means of operating Professional DataRetrieve.

The purchaser is required to load the package using the original disks and then enter name, address and other particulars. This information is coded into the disks and, at the same time, all copy protection is removed. Unlimited backup copies may now be made from the master disks. Each copy will carry the identification of the purchaser, which is a pretty effective way to discourage indiscriminate distribution. Good one Abacus!

Until now the SuperBase range of DBMS software has been the pacesetter, with SuperBase Professional the heavyweight in the Amiga world. After spending some time with PDR I'm convinced that it deserves at least equal billing with SuperBase Pro.

PDR makes excellent use of the Amiga Workbench environment, with well presented menus and friendly file selectors. It permits easy building of input and output 'masks' to make data keying and retrieval simple and comfortable. Due to the clever protection system used PDR does not need any external devices like the dongle which is a definite drawback with SuperBase.

PDR permits up to eight files to be opened simultaneously and enables full relational access between files. Data validation is supported as is programmed data formatting and calculations. A password security feature can be implemented to protect the security and integrity of data. Data integrity is further enhanced by a direct-to-disk approach which minimises data retention in memory, keeping your files safe from power interruption during processing.

A comprehensive and powerful, BASIC-like database programming language provides an alternative means of operating PDR. With over 200 commands and functions, the PDR programming language permits the production of top-class user-friendly applications. Dare I say it after last month's column, you could even write an excellent genealogy package using PDR and its language.

PDR caters for six types of data fields: Text – including all alphanumeric characters and punctuation marks; Date; Time; Number; IFF – permitting any type of IFF file, image, sound, text, and so on; and Choice – which allows only a pre-selected range of inputs. The IFF file type makes PDR enormously flexible and means that, effectively, complete documents can be stored in single fields of the database.

The package includes a number of in-built tutorial exercises which, together with the well-presented and indexed manual, make learning PDR a pleasure. I guess you could say that I liked this package. I felt comfortable with its controls and it responded in the way I expected to just about every action I took.

With a RRP of $299 I reckon Professional DataRetrieve is well worth considering if you're in the market for a database package.

Fast Drive

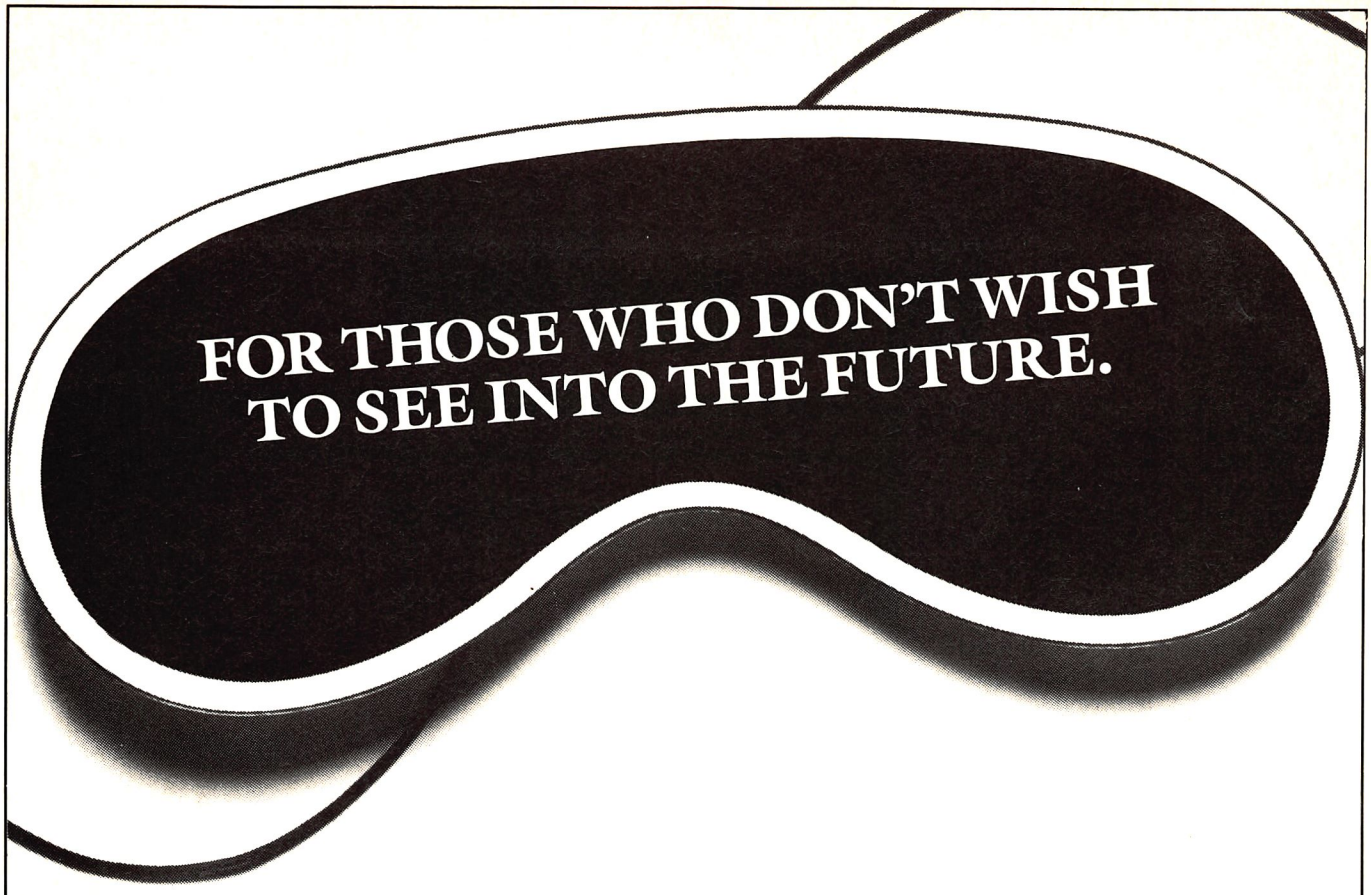
ABOUT 18 MONTHS ago I purchased a Fast Drive 100 hard disk drive to hang off an Amiga 1000. For the first six months or so it worked beautifully and then I began to experience intermittent problems. The drive would appear to power down and up again for no apparent reason. I suspected a software problem and gave myself nightmares trying to track the problem down. Fast Drive hard disks are made by a company called MultiSoft in Perth, and I finally gave up and called them in. Fortunately they had a company rep in Canberra at the time and he called around shortly thereafter. He explained that a small number of the 100 model drives had a problem with their internal power connectors. The spade connectors were crimped onto the cable rather than being soldered. After a time the join can become oxidised and faulty.

Sure enough, upon opening the box and examining the connectors they proved to be fairly loose on the cable. A few quick dabs with a soldering iron put them to rights. I'm delighted to be able to report that now, months later, the drive is working beautifully.

The Fast Drive 100 is a 20-megabyte hard drive contained, with its own power supply and controller electronics, in a shoe-box sized steel case colour-matched to the Amiga. It connects to the Amiga, any model, by a flat ribbon cable to the parallel port. On the back of the FD case are three sockets. One for the computer connection, one for the parallel pass-through for your printer, and a SCSI connector which permits up to six more devices to be daisy-chained.

One minor shortcoming, on my drive the printer connector is a male type requiring the printer cable to have a female fitting – as used by the Amiga 1000. Also the printer pass-through doesn't work unless the drive is powered up.

These couple of minor nuisances aside, I am delighted both with the drive and with the excellent service from MultiSoft. They don't exactly give them away in cereal packets but if you are serious about the use you make of your Amiga you could do a lot worse than invest in a Fast Drive. Contact MultiSoft in Perth on (09) 322 6637 for more information. □



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STEWART FIST



Hype and talk

WHEN APPLE KEPT HyperCard clasped tightly to its corporate bosom at the time it was devolving its software arm to the newly created Claris, I must admit I was a bit cynical. Apple's excuse at the time was that HyperCard was not an application but rather 'system software'.

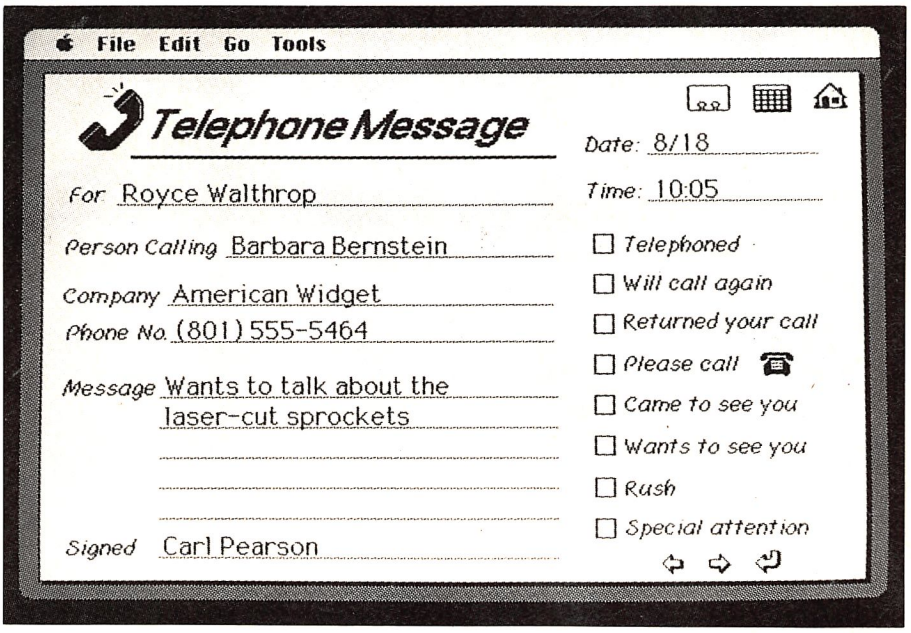
We all chuckled a bit at that. But apparently there was enough truth in the statement to satisfy Bill Gates at Microsoft who had lead the push to drive Apple out of the software business. The major software houses were threatening to stop writing for the Mac unless Apple concentrated on hardware. Hence Claris appeared with all the applications, while Apple retained HyperCard, System and Finder.

Incidentally, have you noticed that Claris now say they won't support Apple products any more. If you haven't upgraded to a new Claris version of MacWrite, MacProject or whatever, you are now out in the cold. I think this is a bit rough, personally. Fortunately Apple retained HyperCard and they are continuing to support it – in fact, they are more than supporting it. HyperTalk, the object-orientated language behind the program is being upgraded and made a central part of Apple's language strategy.

HyperCard hasn't been the raging success that everyone predicted at the time it was first released. Like a lot of computer products, it was oversold to blazes, and then a period of deflated expectations set in. HyperCard has proved to be more novelty than an essential in business, although there are obviously areas where it will make an impact – eventually.

HyperCard was grabbed up with enthusiasm by the hackers who then proceeded to write and exchange thousands of stacks – 99 per cent of which are useless. As a do-it-yourself application, it found a minor place as a phone-list manager, but that's about it. However, we shouldn't sneer prematurely – it now appears likely that HyperCard will take on new roles.

First of all HyperCard is already being used as a simple front-end to Oracle which is the world's most widely used mainframe and mini database manager. Oracle has done this through a whole lot of specially written access routines using the external commands facility built-in to HyperTalk. The second direction that HyperCard appears to be taking, is as an interactive educational tool – either as a stand-alone training application, or as a controller for a videodisk or CD-ROM drive.



Shortly after its release, HyperCard was grabbed up with enthusiasm by the hackers who then proceeded to write and exchange thousands of stacks – 99 per cent of which are useless. As a do-it-yourself application, it found a minor place as a phone-list manager, but that's about it.

I've written before that the only really practical use I ever found for HyperCard was to simulate a complex interactive videodisk-based IBM InfoWindows program I was authoring for a local museum. In only hours I set-up and debugged all the complex branching pathways of the program – and then it took weeks to translate the results to InfoWindows.

This is where HyperCard really shines. It is simple to organise and to create links – although it is very restrictive in the way it handles only card-size text with just one window and no colour. All the same, it has a lot of potential in education and training – as long as the teaching institutions have had the money and foresight to buy Macintosh.

Lately Apple has added videodisk and CD-ROM commands to HyperCard, so we are beginning to see quite excellent self-paced learning material appearing in this medium. There are now a couple of compilers for HyperCard which also extend the program's applications into new and different areas. At the PC-89 show I saw a demo of an educational stack showing a graphic illustration of an internal combustion engine in motion. HyperCard was simply flicking through a sequence of cards on a standard Mac SE at an enormous rate, probably around 30 cards per second. It was just like watching movie film, but it could be slowed down, stopped and studied – and the demo came with sound-effects too. You can only do this when you've got compilers.

The real changes with the program, however, are more to do with HyperTalk – the language. Bill Atkinson, the designer

and programmer of HyperCard created HyperTalk using as his model Alan Kay's SmallTalk language. Jean-Louis Gassee, president of Apple's products division, is now heading a HyperTalk standards committee comprising a number of Mac software developers. The aim of the committee is to define the directions that the language is taking, and to 'prevent fragmentation as third-party applications appear'.

The first of these third-party applications has already appeared in the form of a super-HyperCard (appropriately called Supercard) from a small company, Silicon Beach Software. It supports colour and adds a debugger, while 'extending the scripting language', according to the company. Some of the extensions are used to 'manage windows'. It is this last claim that worries Jean-Louis more than a little – he can see HyperTalk having more versions than Basic if Apple doesn't quickly grab hold and thump the language 'extenders' a little. He has as his model the Academie Francaise which maintains purity in the French language.

Silicon Beach don't boast quite as loudly about a couple of other features of Supercard. You need a Mac II with two megabytes of RAM to make it work. However David Frith who writes on the Mac for the Sydney Morning Herald, saw the program in San Francisco and is most enthusiastic – apparently it is close enough to HyperCard to read standard stacks. I guess we'll see it in Australia soon.

It now appears likely that HyperCard will begin to take on a range of new roles.

Apple's tacit endorsement of Supercard is interesting considering they own the competing product. It is a pretty good indication that the company is keen to promote HyperTalk as a general application language. Some reports even say they are planning to add HyperTalk modules into the Mac operating system.

The company also sees HyperTalk as an important tool in the development of interprocess communications. In a few years you should be able to write HyperTalk scripts in one application, and have this application talk directly to another: spreadsheets to graphics, word processors to databases, applications from one software house to applications from any other.

Many software developers will sit on the fence for a while by incorporating HyperTalk extensions as part of their macro languages. But Matrix Software already has an IBM HyperCard clone called Matrix Layout on sale in the States that can read Mac HyperCard files through a LANs, so Apple need to move fairly quickly if they are going to keep control of the language and yet promote it widely as the universal panacea.

Given this push, HyperTalk could well prove to be the central component of Apple's strategy to destroy boundaries between systems and software, and have (as Sculley says repeatedly) 'the best set of user-programming tools, by 1990.' □

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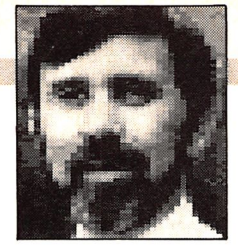
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MAQ 2215

JOHN HEPWORTH

DOS Mate



DOS Mate is in my travelling kit, so that no matter which machine I am using, I will always have help available.

I WOULD LOVE a dollar for every time someone has asked me how to copy a file. Time after time, fortunately with different people, I have to say 'COPY source, target'. The same goes for a host of other DOS commands. Wouldn't it be great if there was a pop-up help screen for DOS?

DOS Mate is just that product. It is a TSR (terminate and stay resident) program that is loaded into the system. It then goes to sleep, using up a bit of memory, and the usual DOS prompt reappears. The user can now run any DOS command or any other program. When help is needed, press the Alt and Return keys at the same time. Whatever is happening on the PC pauses, and the DOS Mate screen pops-up over the existing screen.

When DOS Mate pops-up, it reads a 320K data file containing all the help information. The opening screen is essentially a table of contents. It is divided into five boxes each listing a range of commands or topics. The first and largest box lists DOS external and internal commands used either manually or from batch files. The second lists commands used only in batch files. The third lists commands used only in CONFIG.SYS files. The last two boxes list miscellaneous topics.

Any item in any one of the boxes can be selected by using the cursor keys to move the cursor, and pressing Return. A screen full of help about the selected topic appears. Alternatively, pressing the leading letter of the desired command moves the cursor to the first command starting with that letter. Press again a couple of times until the cursor arrives at the desired command and press Return to select it. A mouse can be used, and is very useful.

The information is clearly and concisely expressed, and good use is made of highlighting to point out key words. Sometimes more than one screen will be required to fully explain the topic, and in this case it is easy to page back and forth. No less than 17 screens of information are provided for COPY.

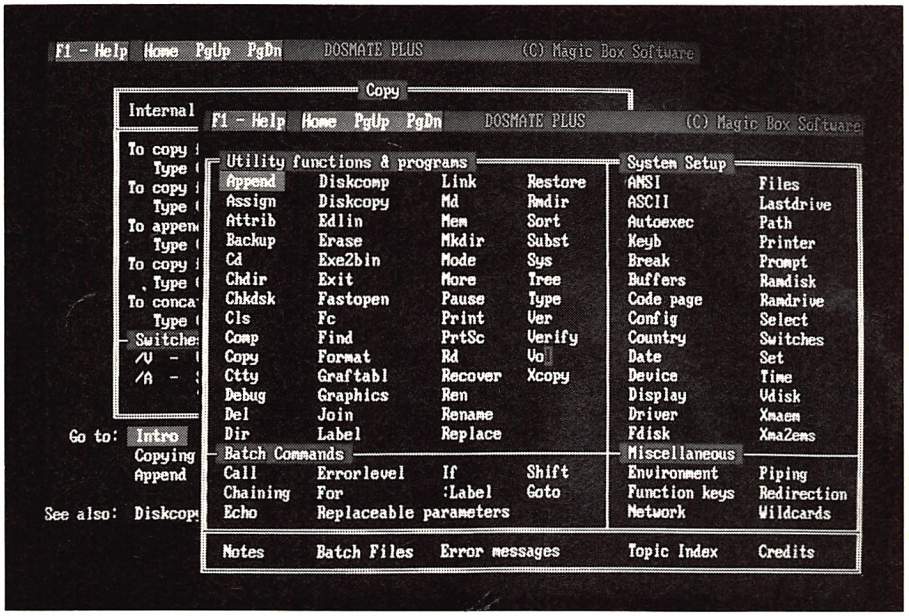
Topics are extensively cross-referenced. At the bottom of each screen are the names of other topics that have some connection with the screen being displayed. Selecting one of these topics with keyboard or mouse displays it instead. As an example, COPY is cross-referenced to three other topics – DISKCOPY, REPLACE and XCOPY. All the information on other topics is just as extensive and well laid out. DOS Mate claims to be for all versions of MS-DOS and PC-DOS from 2.0 to 4.X. It does this by noting on each screen which versions of DOS have the command and syntax displayed.

Installation is easy. DOS Mate comes on a single disk. Create a DM directory on your hard disk. Copy to it all the files on the distribution disk. These files are the main TSR program DMPLUS.EXE, the data file DMPLUS.ELP, a program ASK.COM for use in batch files and an installation program DMPLINST.EXE. Run the installation program to select monitor type, and exit while saving changes. This automatically sets the correct directory where DOS Mate will look for the data file.

The installation program is also used to set the foreground and background colours. (In the accompanying screen shots, I changed the default colours as, while the originals are easy on the eye, they wouldn't be easy to read when printed.)

DOS Mate is a vital program for users at all levels. I know there are several commands that I rarely use, and when I do I have to drag out a manual. Novices would be even more gravely affected. In many offices there won't be a DOS manual within miles of the computer so users, both novice and expert, are left to rely on their memory or guess work. How much better it would be if each machine had a copy of DOS Mate ready for instant reference. DOS Mate is in my travelling kit, so that no matter which machine I am using, I will always have help available.

The version of DOS Mate I tested was DOS Mate Plus version 2. It is a product of Blue Mountain company Magic Box software and is distributed by Software Wholesalers (02) 957 6686; the recommended retail price is $95.



When DOS Mate pops-up, it reads a in 320K data file and presents the opening screen showing DOS external and internal commands used either manually or from batch files, commands used only in batch files, commands used only in CONFIG.SYS files and two boxes listing miscellaneous topics.

MicroRef

KEYBOARD TEMPLATES and quick refer-

ence guides come with many packages, but there is now a range of excellent third-party templates and guides from Micro-Ref. Recently I took a look at their templates and guides for Microsoft Word 4.

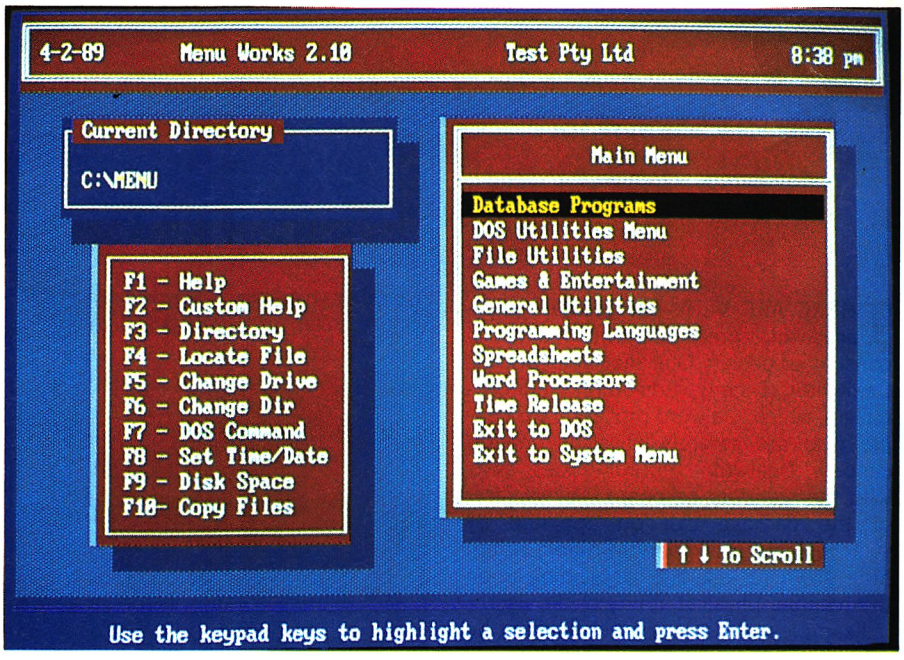
The kit has one template for keyboards with 10 function keys arranged in two columns at the left side of the keyboard. Another strip template is provided for keyboards with function keys in a row across the top, with the assignments for keyboards with ten function keys on one side and for those with 12 on the other. A third template is provided the width of the original IBM PC keyboard and about 50mm high. It has a number of boxes titled Character Formats, Paragraph Formats, Page (Division) Formats, Using Tab Ruler, Hyphenation Check Spelling, Repagination and Printing, Typing Commands, Typing and Editing, Managing Documents, Highlighting with a Mouse, Editing with a Mouse, Highlighting with Cursor, Editing Highlighted Text and Cursor Movement. Each box contains one short line of help for each of several subtopics.

The quick reference guides are excellent. They have over 100 pages, each about 200mm by 100mm. Printed on tough pages, and bound with a wire spiral, the pages are water resistant and difficult to tear. Each page has an edge tab with the page number and a one or two word title. While thumbing through, the tabs will quickly find a topic, and a good index is also provided. The information in the guide is in point form, and explains most tasks as a series of steps with little padding. As a result it is small enough to sit on any desk, easy enough to use, hard to abuse and valuable to all.

MicroRef is represented in Australia by Step Up Systems (03) 429 5611. Their guides and templates are available for many popular applications, at a cost of $34.95 for quick reference guides and $19.95 for the keyboard templates.

Menu Works

DRIVING A PC from the DOS prompt was alright for experts in the days of floppies. Now, big hard disks are common, many users are relative novices, and people may have to use more than one machine. It is hard to remember exactly what applications are available on a machine, in what directory, and what commands are required to run them. These problems have spawned a plethora of menu programs. Menu Works is one that came my way recently. It is rather nice, and not only does



Now that most office computers have a hard disk and users are often moving from one machine to another, it can be a nuisance remembering which applications are on which and what commands are needed to run them – Menu Works addresses that problem very well.

it work well, but it is a very reasonable price.

The Menu Works screen has a title box at the top with date, version number, the user's name, and the time. A box beneath it shows the current directory. Another has a list of the function key assignments, while the biggest box has the menu itself.

The initial menu is a list of menus for applications under various topics like database programs, spreadsheets or word processors. A cursor bar can be moved over a line by either the cursor keys or a mouse. Pressing Return or clicking with the mouse shows the next lower level menu. Typically, only the first level menu will show the names of second level menus, and they in turn will only show the name of applications, but the user can define almost any menu structure desired. Quite extensive customisation is possible, while there is a small programming language to enhance the power of individual menus.

Installation is easy. The distribution disk comes with an auto-install program. This prompts the user to specify the drive on which Menu Works is to be installed. The install program then creates a MENU subdirectory, and loads the program files into it. The install program can analyse the various disks and create menus from programs found on them. It then modifies the AUTOEXEC.BAT file, amending the path statement amongst others.

The menus created automatically are pretty good. On my hard disk it found most common commercial programs, and some public domain and shareware applications. Only a few were mislabeled, a result of more than one application developer using the same filename, and not too many were completely missed. I would have liked to be able to edit the installation data file and make sure all my common applications were correctly described in it so that automatic menu creation resulted in perfect menus, but it is not in plain text and can't be changed. Fortunately, editing the menus, including adding packages and whole sub-menus, is easy.

Menu Works comes with a good manual, about 100 pages long and about the same size as a floppy disk. It is pretty clear, though the section for novices on using menus is buried in the middle of the manual, and really should have been at the beginning. Overall, Menu Works is good value. It is very easy to use for novices and convenient for experts. Menu creation requires a little nous, as the automatically created menus must be massaged, but this is not hard.

Menu Works is distributed by VaporWare, (02) 632 8841, and is priced at $50. □

JEFF PONTON



A Deal for the Disabled

THERE ARE VERY few software packages which break new ground, either in concept or design. One that does both is Dealwriter (Dignity, Education And Language), which is a word processor for people who are severely physically handicapped. Dealwriter entirely does away with the standard keyboard – every facet of the package can be operated by switches, which can vary in number from nine down to just one, depending upon the residual physical ability of the user.

Examples of some switches that can be used with the package include simple push buttons, small or large, arranged in a line or in a compact group; joysticks with movements in four or eight directions; switches which operate on air pressure; devices which operate by the interruption of a beam of light; or sound-activated switches. Switches can obviously be activated by any part of the body. Virtually any device or arrangement which will close a contact can be used as a switch, even blowing down a tube.

The package comprises a program disk, a comprehensive manual, and an interface box, or switch adapter, which plugs into the parallel port. The program is written in Turbo Pascal, and is designed for 128K Microbees with at least one drive.

Because of the wide range of physical handicaps which Dealwriter addresses, switches are not included in the package. These must be designed in conjunction with therapists and specialist institutions.

Upon booting, the program needs to know how many switches will be in use. For demonstration purposes and to assist therapists to become familiar with the package, the numeric keys on the keyboard are also operational. The user operates the highest numbered switch (or key); this configures the program to operate on just those switches. Verification is required by pressing switch 1. Pressing any other switch re-initialises the program.

If the user is limited to just one switch, the program is operated by activating the switch when one of a range of possible choices is displayed during the course of a continuous cycle of options. This 'scanning' technique only applies to the one-switch environment.

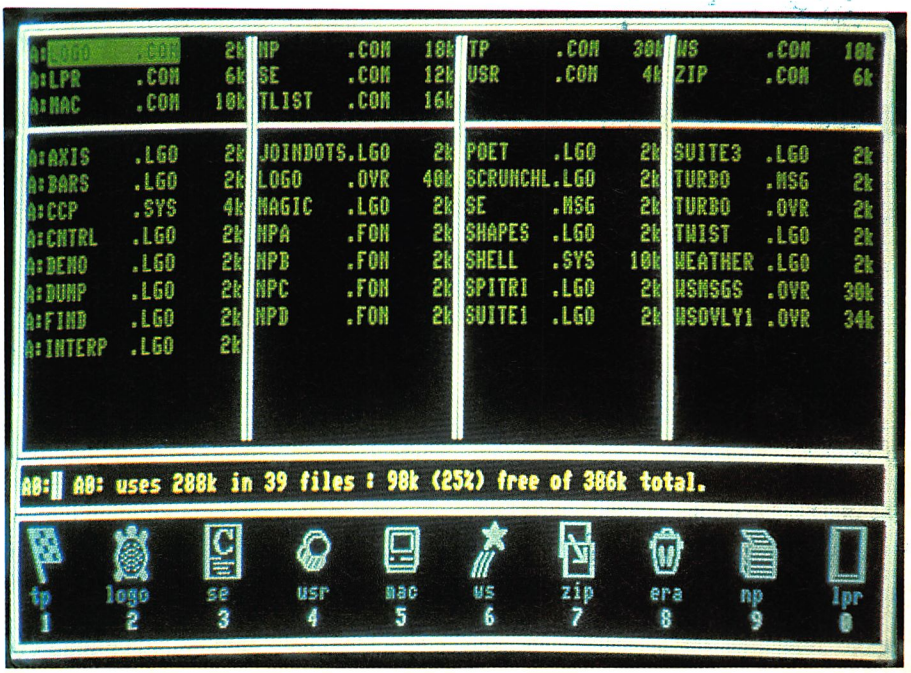


Figure 1. *Dealwriter entirely does away with the standard keyboard – every facet of the package can be operated by switches, which can vary in number from nine (as can be seen across the bottom of the screen) down to just one.*

Scanning

BRIEFLY, there are almost always nine numbered options available on the screen. The concept of scanning is that the numbers from 1 to 9 are successively printed to the bottom line of the screen. Following each number, several dots are printed to the screen during the course of a time period of two seconds, then the next number is printed. This line is displayed as a continuous loop, the line being cleared after all the numbers have been printed. The user operates the switch when the number corresponding to a desired choice appears. The elapsed time between successive numbers may be set from half a second to ten seconds.

This concept is excellent, and one that does not seem to have been used in any other application, although it would appear to lend itself to a variety of other computing contexts, not necessarily just for handicapped people. The program allows for three distinct types of scanning, depending upon the needs and abilities of the severely handicapped user.

The simplest, Auto Scan, is dependent upon the user operating the switch during the period when the requisite number is being printed to the screen.

Reverse Scan caters to the needs of those people with a particular disability. Scanning starts when the switch is held down, and the selection of a number is made by releasing the switch.

With Step Scan, at each use of the switch, the sequence steps forward by one number and the selection is made when a preselected time interval has elapsed since the switch was last used.

The implementation of these scanning methods was the brain-child of Dr Alan Moore, the author of Dealwriter, after

much practical research and observation of the types of disability which the program was designed to help overcome. A side benefit to the use of scanning is that handicapped users very often develop increased co-ordination.

Once the number of switches has been set, Dealwriter brings up the Alphabetic Display with eight numbered columns and eight numbered rows containing the letters of the alphabet, 29 of the most commonly-used words, punctuation marks and special characters.

If the user has selected an alphabetic character, the subsequent display is limited to the alphabet. Selection of a desired word, if it appears, is again by column and then by row. Options within this selection return the user to the Alphabetic Display if the word is not listed, or permit cancellation of the screen if the letters are incorrect.

The selected word is added to the text at the top of the screen, and the process is repeated. When a desired word is not listed, the Alphabetic Display is set for selection of single letters, and the display is labeled accordingly.

The program has an on-board dictionary of 3500 words, chosen as comprising more than 70 per cent of the words most commonly-used in written expression (the list was derived from an American study of the 5000 most commonly used words – Moore adapted the list to the requirements of the program and removed or replaced words which were obvious Americanisms; he is careful to point out in the manual that the final choices are often subjective).

While there is no facility for the user to edit this dictionary, there is a facility to construct an additional dictionary, which is limited to a maximum of 40 words. Phrases may also be included in this separate list, but, for the purposes of access by the program, any spaces in a given phrase must be replaced by commas. If such a phrase is inserted into the text, the commas are automatically removed.

Where a smaller number of switches than nine is employed, combinations of the fewer numbers are needed to choose a column or row. Consequently, with fewer switches, the number of switch closures necessary to select a column or row becomes larger.

Unimpaired users of any word processor, normally obtain one character on the screen for each keypress. The average efficiency (switch closures per screen character) when using Dealwriter varies according to the number of switches in use. However, because of the effectiveness of the on-board dictionary, when nine switches are used this efficiency remains approximately 1.00 closures per character. With only two switches in use, the average efficiency is 3.22 closures per character, which seems quite remarkable.

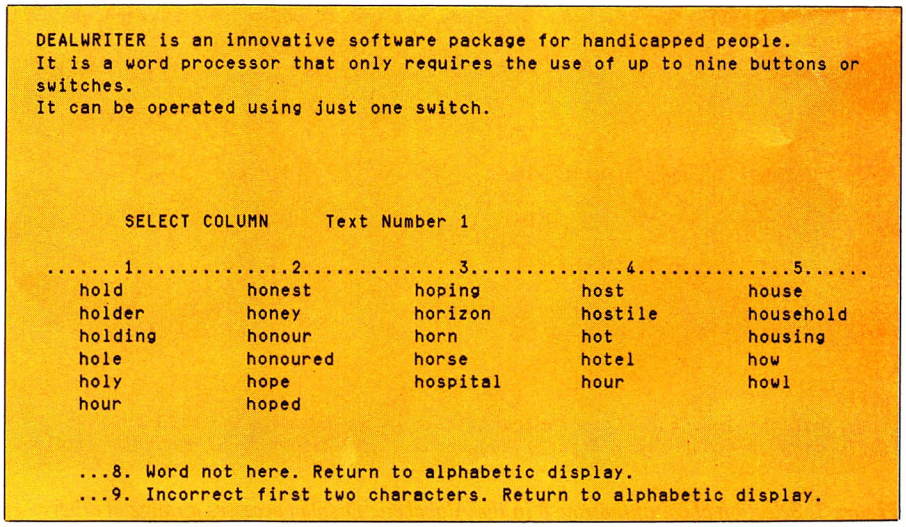


Figure 2. When the switch options have been selected, Dealwriter shows the Alphabetic Display which has 29 of the most commonly used words as well as the alphabetic characters. In Double mode, when two letters are selected, the words beginning with those two letters are displayed from the 3500-word dictionary included with the package.

In all cases, selections are made with the switches in the standard manner. One area which seems unnecessarily complicated is file handling. The package allows for nine standard files, but each file may comprise four blocks of text, each of up to 800 characters. Texts within a file are stored according to the last word in the block of text.

A reason for this is that the maximum amount of text which can appear on the screen is ten lines, and there are no scrolling facilities. Blocks of text may be chained, however, and longer documents can be created by printing just the top line of the text currently on the screen, which is then deleted to allow the remainder of the text to scroll up.

When making criticisms, it is pertinent to consider the overall context of the package. Dealwriter is primarily a program to allow severely physically handicapped people to write letters. Considering the relatively slow rate at which text would be created, long documents would obviously be largely out of the question. Essentially, the program offers written communication to people who previously were denied it. To that extent, it succeeds admirably.

A feature of the hardware design is that the printer, if it is a parallel printer, is connected to a plug on the cable from the interface box, thus doing away with any need to change connections. Serial printers are connected in the normal manner via the serial port. Instead of a printer, a speech synthesiser may be connected; however, this option is still largely in the experimental stages.

Dealwriter certainly reflects efforts and research carried out by Moore over a long period of time. Because of the nature of the package, it is an evolving program, and much scope exists for the inclusion or modification of features, based on feedback from handicapped users. While it was designed originally to take particular advantage of the Microbee, Moore is looking at ways of introducing it to a range of other machines.

Dealwriter costs $120 – inquiries should be made to Deal Communication Centre, 538 Dandenong Road, Caulfield 3162 Vic. Phone (03) 509 6324.

Designer icons!

IN AN EARLIER 'Microbee File', I mentioned that I would show users how to redesign the icons in the 128K Shell. One of the long-term frustrations of many Microbee owners has been the difficulty of modifying the icons and their definitions.

One way to run your favourite program, be it Basic or Brikball, via an icon, has been to rename it to conform with one of the icon definitions, say, CALC.COM. This solution, however, is scarcely aesthetic,

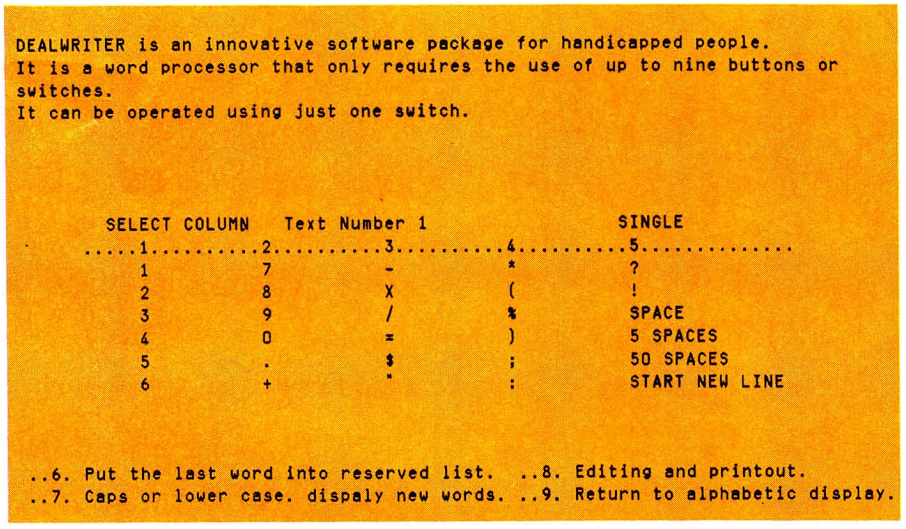


Figure 3. *Selection of column 8/row 8 in the Alphabetic Display accesses a range of other screens and options: the first is a Numerical Display (pictured), which includes miscellaneous characters. Other screens can subsequently be accessed for block moves of the text, obtaining printouts, and file-handling. In general, option 8 takes the user into more advanced areas of the program, while option 9 has the opposite effect.*

and is certainly ambiguous. With a large number of program disks, it can lead to confusion and the accidental erasure of programs during transfer operations.

Once the areas containing the relevant data have been identified and located within SHELL.SYS, it is surprisingly easy to alter the icons and their definitions to suit the individual requirements of the user. Although several disk utilities, including DDT and ZSID, can be used to effect the changes, I used Disklook (I reviewed this slick utility in the May issue), from GreyMatter Software, to create several new icons, each with appropriate definitions.

Imaginatively designed icons which reflect the nature of the programs they represent are particularly effective on games disks for young children, who simply have to press the number associated with the relevant icon. However, they can only be used to run programs with a COM extension.

An icon comprises six PCG characters (see Figure 4). Each character is made up of eleven bytes, and there are eight bits in each byte.

The first task is to design the new icon. The easiest way to do this is with graph paper – a bit of trial and error is usually needed before the best effect is obtained. As can be seen in Figure 3, the grid for each icon is twenty-four squares across and twenty-two squares deep.

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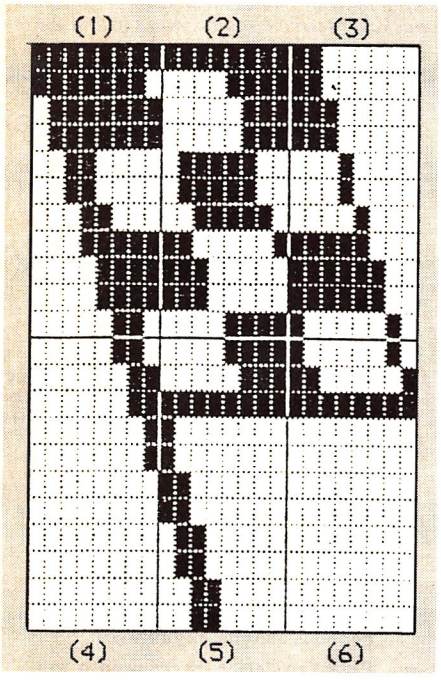


Figure 4. *Once the areas containing the relevant data have been identified and located within SHELL.SYS, the icons and their definitions can be altered to suit individual requirements. As shown, an icon comprises six PCG characters, each character is made up of eleven bytes, and there are eight bits in each byte. As can be seen, the characters for each icon are stored in SHELL.SYS in two rows, each containing three characters.*

ance of the icon, the next step is to calculate the eleven hexadecimal values for each of the six characters. When altering a file, all values must be entered in hexadecimal notation. There is absolutely no need to work out the decimal values, then convert them to hexadecimal, although this seems to be a favourite ploy with many users – see Figure 5.

For version 2.34 of SHELL.SYS, the locations of the data for the ten icons are –

```
Icon 1   0E1 - 122
Icon 2   123 - 164
Icon 3   165 - 1A6
Icon 4   1A7 - 1E8
Icon 5   1E9 - 22A
Icon 6   241 - 282
Icon 7   283 - 2C4
Icon 8   2C5 - 306
Icon 9   307 - 348
Icon 10  396 - 3D7
```

The address gaps between icons 5 and 6 and between icons 9 and 10 contain data for the other PCG characters that the Shell uses, such as the borders and the various corners. There seems very little point in altering these values, but I would certainly be interested to hear the details if you decide to experiment and manage to come up with any improvements. You will initially need to work in reverse, transferring the values to graph paper, to examine these border and corner characters.

If your version of the Shell is an earlier one, with only nine pictorial icons, the addresses will be slightly different from those given. Try subtracting 14 hex or 24 hex from the addresses listed. These early Shells do not contain a version number in the code. For all versions, however, the six values commencing from the first icon address are FF C0 C0 C0 C0 C0.

Without major disassembly of the Shell, which is beyond the scope of this article, it is not possible to adequately redefine the commands for the icons representing USR, INIT or ERA, although their pictorial representations can be altered in the manner I have described. In any case, if you use the Shell as your normal operating environment, it is most likely that you will want to retain these commands.

When you are satisfied with your artistic efforts, boot-up Disklook and insert the disk containing a copy of SHELL.SYS. Be sure to retain the original, as mistakes do happen. Use option 3 to find the appropriate blocks from the disk map. Use option 2 to locate the start of SHELL.SYS. Each screen of data comprises 100 hex values (256 decimal), which makes it a simple matter to locate relevant addresses. Modify the file with Line Feed, and insert the new values.

Where the values continue onto the following screen, you will have to save the changes to the current screen before proceeding. After you have altered the values for the first icon, exit with ESC and cold boot the disk. Your new icon will be displayed, but still with its original defined command.

If something has gone wrong and the icon looks a mess, check that you have entered the data for the six characters in the correct order, that is, the three characters in the top row followed by the three in the bottom row. The other probability is simply that you have calculated or entered incorrect hex values.

With the icon drawn to your liking, the next step is to redefine the command. Version 2.34 of SHELL.SYS lists the commands starting at location 1C64 (counting

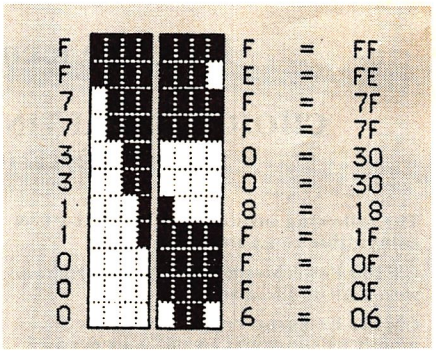


Figure 5. *The first (top left) PCG character in Figure 4. To demonstrate the easiest method of calculating hexadecimal values directly, it has been split vertically. Simply work out the unit value, in hexadecimal, of each side of the byte, then concatenate the values. For example, the left-hand side of the second value is F, the right-hand side is E, and thus the hexadecimal value of the byte is FE. The remainder of the values can be worked out in a similar fashion. With just a few minutes practice, you will find that you can calculate the hexadecimal values almost as quickly as you can write them down.*

the first screen as 0, page through to screen 1C, or 28 decimal). For earlier versions, try 18EF or 14D4. Again using Disklook, press Line Feed to modify the values, and use Tab to toggle character mode on.

You may need to experiment to centre the command beneath the icon. Try to modify a command which is the same length, or longer, than the new one. Replace excess characters with spaces before and after the old command, and be sure to leave the null character, 00, between commands. Don't extend the list of commands beyond the existing block of characters or the operation of the Shell will be corrupted.

That's all there is to it. If you don't have Disklook, and you use DDT or ZSID to make your modifications, follow the instructions for those utilities, and add 100 hex to all of the addresses shown.

For those who can't resist a challenge, and one which isn't too difficult, you might try writing a utility to alter the icons, with their definitions. Preferably have a large grid, representing the bit values of all six PCG characters, on the screen to allow modifications, with the icon – of the correct size – to one side so that the effect can be seen immediately. Such a utility could be written in Basic, Turbo Pascal, C or Assembler. Good luck, and let me know how you fare! □

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Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies – no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

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The following is a small selection from the library:-

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Jim Button's very popular database system. Works with other Buttonware software eg PC-TYPE, PC-CALC+.

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A very popular tutorial on the BASIC programming language which increases in complexity as the user progress.

#199, #1016 & #1017 PC-CALC+ (3 disk set)
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#287 & #288 FILE EXPRESS (2 disk set)
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#320 TOUCHTYPE
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#344, #345, #1032 & #1124 PC KEY-DRAW (4 disk set)
Combines CAD, paint, slide show and desk top publishing into one package. Fast and easy to use with or without a mouse.

#403 PC-TUTOR
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#404 EZ-FORMS
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#455, #681 & #682 PC-TYPE (3 disk set)
Jim Button's WP with on line help, spelling checker, whoops key, and mailmerge which works with PC-FILE, Wordstar and ASCII files.

#499 PROCOMM
Datastorm Technologies state of the art telecommunications software.

#505 PC STYLE
Analyses text files for readability - considers the number of words per sentence, % of words of specific length, personal words, action words. Make your writing read better.

#524 & #525 EXPRESS CALC (2 disk set)
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#608 AUTO MENU
Magee Enterprises menu management program that has become one of the largest selling Shareware programs.

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Six games to teach basic reading skills to a pre-reading child. Positive reinforcement helps the learning can be fun approach.

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A full featured Business and Technical graphics package with 18 graph types. Single key commands plus macros and "learn" mode. Data input from keyboard, Lotus, dBASE, SYLK and ASCII. Full-screen drawing editor included. CGA/EGA screens.

#696 QUBE-CALC
Three dimensional spread sheet with on line help and powerful macros.

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Finds answers fast by working backwards in Lotus, VP Planner, Supercalc ¾ or Multiplan.

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#780 BRIDGEPAL
A great way to practice your bridge with up to three partners.

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A collection of more than 13 utilities from Buttonware.

#812, #813 & #1185 SOAR (3 disk set)
Service Oriented Accounts Receivable for businesses that provide services as well as products. Menu driven and easy to operate.

#816 & #817 TURBO C TUTORIAL (2 disk set)
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Ideal as a learning tool but can be used by anyone who enjoys designing or solving crossword puzzles.

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#870 HGCIBM - COLOUR EMULATOR FOR HERCULES
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A set of Lotus macros to analyse the return on a property using up to 14 different measures.

#1007 C WINDOW TOOLKIT
Designed for the novice and intermediate C programmers who want full screen, colour, cursor and windowing capabilities without complex escape sequences or DOS level interrupts. Even more features for the experienced programmers.

#1058 EXPRESS GRAPH
Easy to use business graphics - Input your own data or load from a spread sheet.

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Provides fast easy backup of your hard disk to floppies - even handles files too large to fit on a single floppy.

#1200 ANYWORD
Produces an index without touching the text. Allows searching for any word or combination of words and even can use "and-or-not" logic.

#1236, #1237 and #1238 PC-FILE dB (3 disk set)
New from Buttonware with a dBase III Plus file compatibility - reads dB III Plus databases in a snap - no conversion. No programming.

#1287 ZOOMRACKS
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MICHAEL BURLACE



Cursory Glance

■ The pocket electronic diaries springing-up all around are getting us somewhere along the way towards a paperless briefcase – something which the laptop forced on those who use them because it filled the attache case and left no room for the paper. Soon the pocket office will emerge, just the thing for people who have those wonderful new Toshiba 5200s. A 386 plus 100Mb of hard disk, ideal for people who want a fileserver for their network and want it to be portable. Now with the addition of a few pocket diaries, you can carry a network everywhere you go – perfect for that impromptu meeting. I can see it now:

SCENE: A Wall Street corner.

CHARACTERS: Harry, a commodities dealer (financially-astute and highly-successful parasite). Bruce, an Australian commodity supplier (farmer). Mary-Lou, a Southern Belle who just happens to be Harry's PA (cute, preferably dumb and in today's bimbo market, highly-paid).

Harry: Bruce, how's things down under on the commodity production line? No, don't tell me, just plug your PD to this here network. [Lays cable from Toshiba to Bruce's shirt, boots fileserver while connecting with Mary-Lou's eyes and PD.] Bruce pulls grubby old Dalgety's diary with sheepdog-eaten corners from shirt pocket.

Bruce: Harry, this diary is old technology, but I have cornered the market in mice – in fact I've got a plague of them. If you're interested.

Mary-Lou: Well gosh y'all.

Harry: Pity, Bruce, I'm not into high-tech shares these days, just crops and livestock.

Bruce (drawls): I don't think you understand me. These are four-legged and furry.

Harry (totally unable to comprehend the words because they are not on his screen): Hmm, seems I have a network error on my fileserver. Mary-Lou, call the mobile network service people, they'll be here in just a moment.

We leave them here and return to the world of real commodities such as lunch and knock-off time.

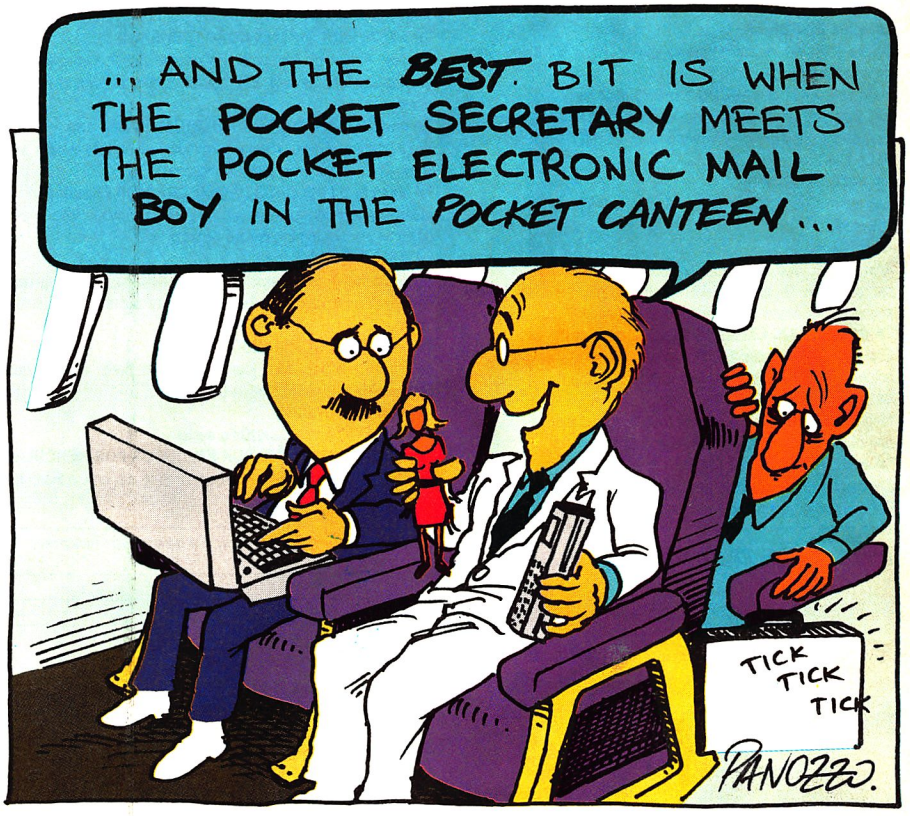
■ IBM has a spokesperson called Doug DeLay. Could be popular with a few software companies if he ever decided to look for other employment.

■ The way things are going in the computer industry, the politicians of the Liberal, National and Labor parties will find themselves getting a higher ranking from the Australian public. This isn't because the pollies are using technology to improve their performances. Nor is it because they are making decisions which will provide us with a better computer industry. No, it's just that the software and hardware companies are making announcements with less credibility and poorer performance than the promises politicians make during electioneering or once they get into their billion-dollar parliament houses.

BOOTSTRAP: The RISC chips (Reduced Instruction Set Chips) pouring onto the market seem to be a raging success. By restricting the number of instructions they carry out, the chips are faster and more effective. And so it comes as no surprise that there have been a few imitators and a few extensions of the idea. These again work on the principle of making the chip easier to build, simpler, smaller and faster. With modified BIOS (Basic Input/-Output System) which takes into account the restriction in the number and range of instructions available to software, the chips perform as well as any others. Well, they did until the latest ones came on the market.

But first a little about the new chips. They represent probably the ultimate extension of RISC. The chips, known as LACS (Limited Additions Chip Set) are designed for a more laid-back style of computing. And, according to the chips' Queensland inventor, Horace Letni, 'the LACS chip is for word processors and everyone knows that the average word cruncher uses letters, symbols and only the odd number. Rarely are the numbers added, multiplied and so on. The most complicated maths any word processor does is to increment the page number,' he said at the chip's launch in outback Camooweal recently. The LACS held no maths instructions beyond 1+1. 'And if anyone did want to run some maths in their word processor, all they had to do was add in the company's MORE (Maths Operations/Relations Engine) and suddenly LACS is MORE.'

Unfortunately for Letni, LACS is no more. They went bust last month, 15 minutes after the laughter from the computer press died down at the launch. □



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